The Builder.

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Sisters' Wing and Infirmary, St. George's Retreat, Burgess Hill.....Mr. E. Goldie, F.R.I.B.A., Architect.
Design for an Open-Air Swimming-Bath.....By Mr. A. Berrington.
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San Francisco.

THERE is a strange irony of events in the fact that during the two years preceding the terrible disaster which has just devastated San Francisco, an elaborate scheme for the improvement and laying out of the city on new lines had been in process of development under the hands of an eminent American architect, and his Report and plans were completed and laid before the city authorities just six months ago. The scheme contemplated a complete re-adjustment of the main lines of thoroughfare and vista, and a gradual rebuilding of the city on a great scale, such as could only be carried out little by little, dealing with one portion of the city at a time. The relentless forces of Nature have at all events cleared the way for the improver. One is reminded of the Great Fire of London which was the opportunity for improved building, new lines of streets, and the erection of a great cathedral and a number of churches at the hands of one of the greatest architects whom this country has produced. Unhappily the opportunity for a new London, in the way of alignment of streets and the working out of a more dignified and centralised plan, was in great measure wasted through want of energy and of large ideas on the part of the authorities. It does not seem likely that this mistake, at all events, will be made in San Francisco. The plan for an improved San Francisco is ready in advance, and we are assured that there is every intention of rising above misfortune, and of making this calamity the opportunity for rebuilding the city according to the most approved ideas of plan and construction. If it be thought that it is foolhardy to set about rebuilding a city on a spot which has been thus visited by earthquake in its most appalling form, we may cite the instance of Lisbon, which was nearly destroyed by a similar calamity just a century and a half ago, but has remained unscathed since. But there is a more rational ground of confidence to be recognised. We now learn that the steel-framed structures carried out on the modern and peculiarly American system which we have not been accustomed to view with much favour, have at all events shown that they are fairly proof against earthquake—the best and most valuable quality which we have yet heard of in connexion with them. They are reported to be almost intact, even in the case of a building which was not quite completed, the owner of which expects to be letting offices in it in a few days. The discovery that such structures will withstand an earthquake that overthrew every other kind of building (unless the Mint, mentioned by a correspondent on another page, is an exception) is one of great importance, and teaches a lesson which is not likely to be overlooked.

There seems to have been an impression that the magnitude of the disaster was in great measure owing to the presence of a considerable proportion of wooden buildings—what are called in America "frame houses"—in the city, and that San Francisco has paid dearly for overlooking the object lesson furnished by the fire which, within the memory of many of our readers, made such fearful havoc of the old wooden-built city of Chicago. This would of course be only as regards the fires that followed the earthquake; for, apart from that danger, we should expect to find that wooden-framed houses would resist earthquake shock a great deal better than those built of ordinary brick and stone walling. But that San Francisco has been careless and indifferent in regard to the danger of extensive wooden building in a great city appears to be quite a misapprehension. On the contrary, the matter has been for some time past the subject of special building regulations carried out in a thorough spirit of reform; and from the following information, which may be relied on, it will be seen that, though it was not possible to do everything at once, the San Francisco authorities have for some years back been proceeding vigorously and systematically towards the removal of this source of danger.

Under the charter of 1898, drafted by twenty-five freeholders comprising the foremost practical business men and lawyers in the metropolis, San Francisco's building and fire ordinances underwent drastic changes. A Buildings Department, supervised by the City Architect; the Department of Electricity; and the San Francisco Fire Department, all co-operated to insure the highest degree of safety when permits for building or repairing structures were petitioned for. Having in mind the necessity for reducing the possibility of conflagrations to a minimum, the Building Ordinance of 1901 revolutionised all previous enactments having for their *raison d'être* the immunity of the city from fires.

The "fire limits" were extended, and each time a petition for repairs came before the Buildings Department the premises desired to be altered were inspected by the Buildings Inspector, under the advice and with the co-operation of the Fire Department; and so rigorous was the campaign waged against the

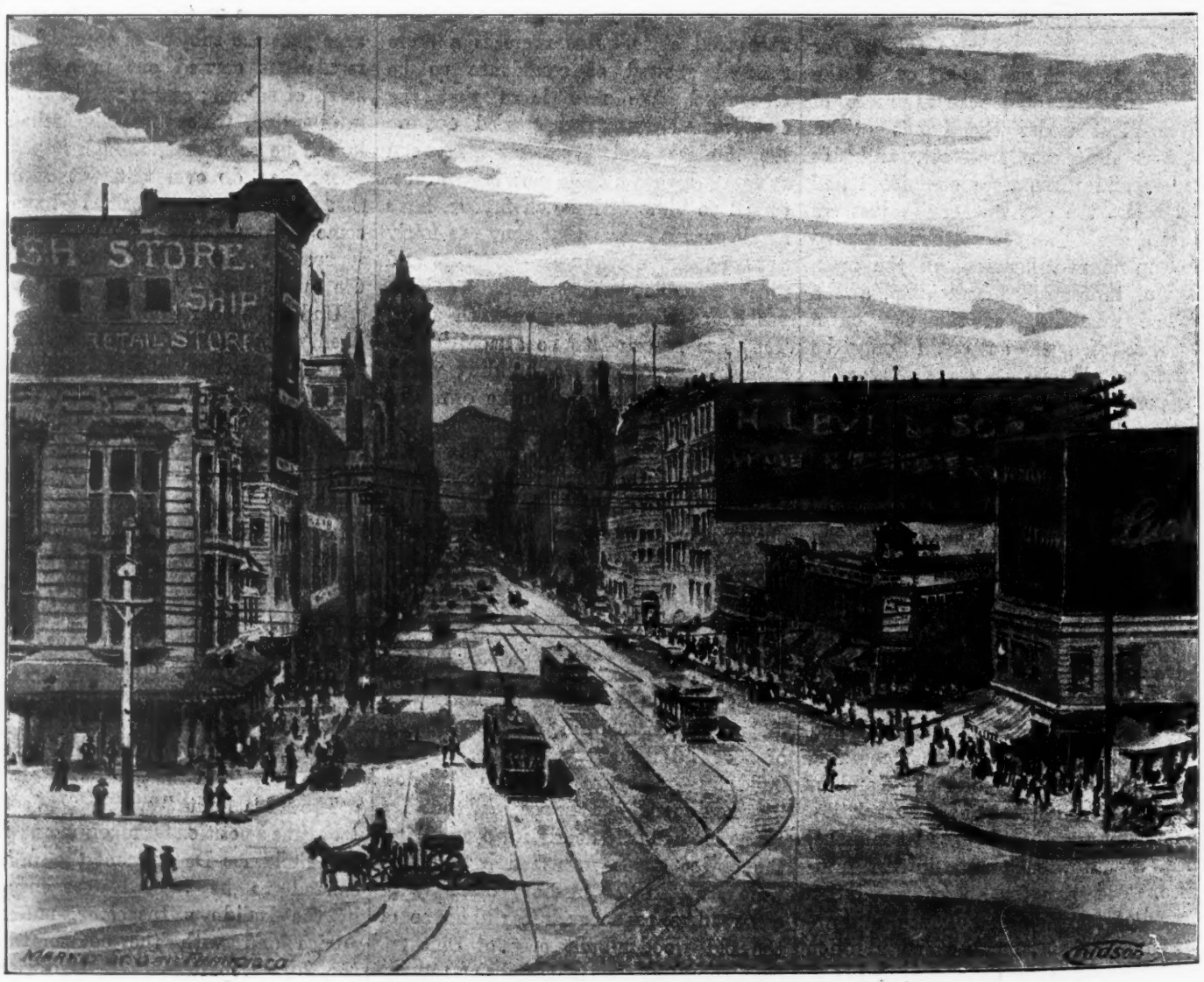
maintenance of unsafe wooden buildings within the fire limits, that in the majority of cases these were ordered to be dismantled, and modern fire-resisting structures took their places. The Merchants' Association submitted a Sign Ordinance in 1901, which was adopted. This did away entirely with swinging signs, except in cases wherein the signs were so arranged as to swing over the footway at night, when they were lettered in incandescent lights, and required to be lighted until past midnight. All other signs were required to be placed at least 8 ft. above the kerb line and not to project over the freehold line for a distance of more than 6 in. at that height, and not more than 12 in. when affixed to the building at a height of at least 12 ft. above the kerb line. Within a year after the passing of this Sign Ordinance one might have looked down Market-street from the City Hall to the Ferry without noting one offending projection athwart the line of vision.

The Building Ordinance provided, as to the fire limits, that all repairs to buildings originally constructed of inflammable materials, should be carried out by the use of fire-resisting materials; and where new structures were petitioned for, the buildings must be of brick or stone, the roofs to be sheathed in corrugated steel or tiles. For districts within and without the fire limits, every detail of the proposed structure was submitted to the City Architect, who examined the plans personally, and passed his recommendation or refusal up to the Board of Public Works, which sat weekly. The petitioner, in case of refusal of the City Architect to recommend issuing of a permit, might have appealed in person to the Board, whose mandates were final and unalterable. Theatres were reconstructed so as to provide a large number of exits, and overcrowding was punished severely. Fire escapes of wrought-iron were attached to all buildings of two or more stories within the fire limits; and all doors and apertures in the buildings of mercantile and wholesale districts were shuttered in steel while the occupants were away. As in other American cities, the housekeeper is unknown in San Francisco, at least in buildings devoted to the conduct of business.

The San Francisco Fire Department was one of the city's glories; under the direction of Chief Sullivan it had reached a condition of efficiency hardly to be exceeded. Its members were required to pass physical and athletic tests which made its *personnel* second to none of the world's fire-fighters; and it is safe to say that had the late earthquake not broken the water-mains, little of the damage which has appalled the civilised world would have been done.

The era of wooden building in San Francisco, at least within the fire limits, has passed away. The steel and stone structure has nobly justified its existence, and the municipal authorities, we are assured, in taking measures for superintending the building of a new San Francisco, will stand for stone and iron with one voice. Elasticity is a saving factor, and in steel we have a material that should enable structural engineers to provide an almost certain safeguard against future ruin of the city by earthquake. But if safety against fire is to be secured the steel framework must be protected by fire-resisting material attached so that it cannot be shaken off or even displaced. Terra-cotta tiles and similar refractory materials cannot easily be fixed to steel so as to comply with these conditions, and it is probable that, in virtue of its elasticity and cohesion, carefully-designed concrete-steel or concrete-cased steel construction would be found the most suitable for resisting earthquake and fire.

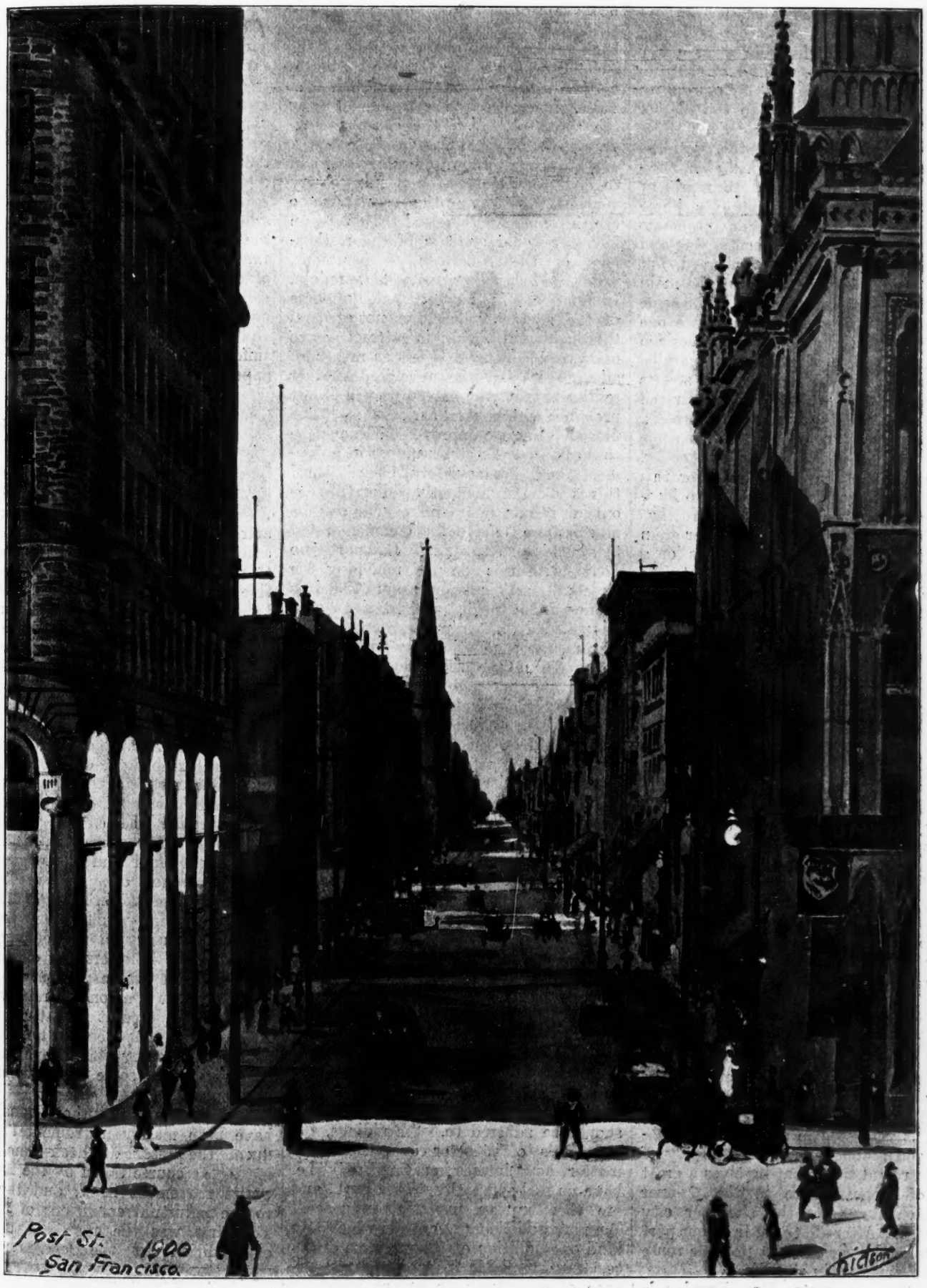
The general aspect of the streets of what must now be called Old San Francisco is indicated in the two sub-joined sketches by Mr. Chidson, showing Market-street and Post-street. The former was, and under the new laying out will still be, one of the principal thoroughfares of the city, though it is a diagonal in reference to the most general direction of the street lines. According to the proposed plan it is to start from a crescent at the wharf in San Francisco Bay, culminating in a kind of circus at the foot of Twin Peaks Hill, the peaks of which are in a line almost on the axis of the street (one of the peaks is seen at end of Mr. Chidson's sketch of the then existing street). Halfway along its course a crescent-shaped *place* is to



Market-street, San Francisco, Looking South-West (Twin Peaks Hill in the distance) ***From a Sketch by Mr. C. R. Chidson.***

open out from the street on its north-western side, which forms the starting-point for a great boulevard which is to branch out due west and conduct to the long narrow ornamental park which runs down to the western shore of the city. For San Francisco enjoys the advantage of having a sea front on three sides, north, east, and west; as at New York, the land transit access is rather restricted by this position, but the three-fold sea aspect undoubtedly makes for hygienic conditions. According to the rule which holds good, no one knows exactly why, in almost all large cities, the western is the best residential side; the eastern margin has the quays and docks and is, we presume, the portion of the city referred to in *The Wrecker* as "the front." The city has several picturesque hills on its borders, or in one or two places almost within the city itself, and the treatment of these counts for something in the new scheme of laying out.

About two years ago the "Association for the Improvement and Adornment of San Francisco" issued a circular letter pointing out that San Francisco had suffered (like many other modern cities, we may add) from the want of a comprehensive plan which would be a guide in laying out new parks and streets, and suggesting that the construction of a boulevard round the shore, the position of public buildings so as to produce the best effect, and other minor matters



From a Sketch by Mr. C. R. Chidson.

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bearing on the general appearance of a city, required consideration. Subsequently they invited a well-known American architect, Mr. Burnham, to draw out a regular scheme for the improvement of the city, and a studio was built for him on the slope of Twin Peaks, where he and his assistants occupied themselves for sixteen months on the plans, for the execution of which fate seems now in so terribly dramatic a manner to have cleared the ground, as if by previous arrangement.

A good American architect of course goes to Paris, not only when he dies, but in search of ideas while he is living, and Mr. Burnham introduces, as a key to his leading idea, a kind of skeleton plan of the system of laying out of Paris, which he reduces to the idea of three concentric elliptical main lines crossed by diagonals from the centre to the circumference. This ideal plan, however, can neither be said to represent Paris as a whole, nor is it as a whole represented in the new San Francisco plan. We have the diagonal streets and the exterior surrounding boulevard, but not the inner concentric lines; the main portions of the plan represent the scheme which seems to be such a favourite one in the artificially planned American cities, of a kind of gridiron of parallel streets and blocks, with other streets crossing at right angles, and penetrated at various points by diagonal streets, which generally begin and end in some kind of open space, larger or smaller. There is something to be said for this system of diagonals, in regard to locomotion; it has the geometrical merit that the hypothenuse is always shorter than the sum of the two other sides of a triangle. Has it any other merit? We rather doubt it. To the stranger in the city, these diagonal routes are puzzling in reference to direction; to the resident and the owner of building property they mean that a very large number of the buildings in the city are cut into triangular shapes equally inconvenient for the architect to plan or for the tenant to inhabit. Judging from some of the extraordinary and portentous-looking angle blocks ("gores" seems to be the name for them in Mr. Burnham's Report), illustrations of which come to us from across the water, it would seem that American architects find a certain diversion in the treatment of high three-cornered buildings with acute angles. Perhaps one may get used to anything; but to the European eye these are, and we hope will always remain, somewhat in the light of architectural monstrosities; and it is possible that the public of American cities, who have to see them and, if not to live, to do business in them, may get tired of them before long. We should certainly recommend, in the plan of the new San Francisco, a reconsideration of this system of diagonals, which is very well in a suburban neighbourhood among houses with plenty of ground round them, but involves a great deal of inconvenience in the manner in which it affects the sites for city buildings. After all, to get from one part to another by the shortest possible route is not everything in city life.

In other respects Mr. Burnham's scheme is a fine one. He makes the most of the hills. He proposes to leave the tops of them as far as possible unbuilt on, and to surround them with two or three zone roads with terraces, communicating by roads up the gradients of the hill, where not too steep. Where they are, it would be a good plan to have a spiral road winding up; we do not notice that this is suggested. In the flat portions of the city it is suggested that a great charm may be added to certain quarters by the elimination of some of the streets in the monotonous system of blocks, and the substitution of a chain of parklike squares, formed in a measure by the un-used or misused back areas. He observes that "the isolated square of the Old World, unless maintained by wealthy residents, is a quiet, almost desolate spot seldom feeling the throb of life. The chain is suggested to obviate this, and induce a current of life to flow agreeably from end to end, to the exclusion of unnecessary vehicles, thus leaving the main traffic to the intermediate streets." This is an idea very characteristic of the restlessness of the American temperament, which seems rather to eschew repose. In London it is this very quiet of some of the squares which are not general thoroughfares which is attractive to many residents, and is felt as rather an advantage than the reverse. Another sentiment in the Report will meet probably with general approval: "The first step in civic improvement should be towards ideal streets, faultless in equipment and immaculately clean. Until this is taken, monuments and statues are out of place; men and events can be much more effectually commemorated by street improvements." It is partly no doubt with this view of rendering the streets pleasanter in appearance that it is proposed that the diagonal arteries should be provided with an underground service of cars, the excavations for which could be made at the same time that the streets are constructed. It would seem then that these diagonal arteries are an entirely new feature; we have already commented on the drawbacks to them, but we admit that the opportunity of creating an underground traffic line would form their best excuse.

Mr. Burnham proposes to increase considerably the extent of public parks in and around San Francisco, forming as far as possible a chain of parks on the outskirts. He would select for parks ground which has a certain natural beauty but which, from its steepness, inaccessibility, or difficulties of drainage, is unsuitable for residences; and as such parks would be more or less on rising ground, the appearance which one will present as seen from another should be considered; and he makes the excellent suggestion that in whatever buildings are erected in such parks a consistent type of architecture of the greatest simplicity should be adhered to. "Buildings, the memorials of *fêtes* or expositions, no matter how interesting they may be, have no real sympathy with a park, and are therefore an unrestful influence." We may add that the crowds which any kind of exhibition on a large scale draws together are liable to spoil the appearance of a park to an extent which it takes a good deal of time and expenditure to recover from. The Paris 1900 exhibition ruined the aspect of the Champ de Mars, and other portions of the ground covered, for a long time after; nor is its effect in this way yet obliterated. Mr. Burnham remarks that if statues are placed in the parks "it is better to make formal parterres and alleys for its reception than to scatter it haphazard"; but this should be taken *cum grano*. Statues should certainly not be placed "haphazard"; they should emphasise and give the central decoration to some special feature in the laying out of the ground; but anything like a collection of sculpture along one walk or parterre becomes a little too like an exhibition; and moreover, a really fine piece of outdoor sculpture will have more impression when seen as the sole object of the kind in the centre of a circle or as the culmination of a vista, than when aligned with a number of others.

In the main, however, Mr. Burnham's scheme is a noble one, and may render the revived San Francisco, with its exceptional advantages of position, one of the most beautiful cities of the world; and we can only add our best wishes for its realisation and for the future safety and prosperity of the city which has suffered for the time under such an appalling and heartbreaking disaster.

THE PRESENT STAGE OF INDUSTRIAL ART.

A PAMPHLET has lately been issued by the Junior Art Workers' Guild* which has attracted a good deal of attention among art workers. As far as we know, this is the first expression of the collective thought of the younger school of architects, artists, and craftsmen which has come into existence in late years, and in whom the difficulties they have to face have bred a seriousness and purpose that will surely have its effect in the years to come. It came out rather appropriately at the same time as the last of the Arts and Crafts Society's triennial exhibitions, each of which has marked a stage in the development of modern English applied art; and it seeks to determine the causes which have lead to the curious situation in which we at present find ourselves—possessing, that is, a school of applied art which is admittedly the first in Europe, but which remains a thing wholly apart from the life and industry of the country, and of which the followers can obtain little or no effective patronage from the public. The pamphlet is at once a review of the history and present situation of the Arts and Crafts movement, an investigation of the forces which have militated against it, and some suggestions as to the remedy.

Two causes the authors consider to have been mainly instrumental in producing the present deadlock—one belonging to the course taken by the Arts and Crafts movement itself, and the other to the industrial conditions of the age. The first was the rash abandonment of tradition by the leaders of the

* "The Junior Art Workers' Guild: What it is and Where it Stands: An Appeal to Craftsmen." Post free 2½d., from the Secretaries, 12, Bedford-gardens, W.

movement in their revolt against what was stereotyped and academic, as to which the authors say :—

"At first this new philosophy seemed to promise excellent results. Men who were saturated with tradition, when they thus took to thinking for themselves, turned out very creditable work. But another generation came along who were without this training, and in their hands the results were very different. Little by little was created a new cult which we know now by the name of 'New Art.' . . . It spread like a plague over Europe. It went from extravagance to extravagance, until finally it has produced what such things always do—a Nemesis of reaction.

"Unfortunately this reaction is telling against the Arts and Crafts movement with which 'New Art' had become too closely identified—'New Art' and 'Arts and Crafts' in the popular mind meaning the same thing—and so that which is real and vital promises to suffer from that which is bad and meretricious, and there is a danger that the good may be lost sight of and disappear."

The remedy proposed in the pamphlet is an intelligent—not slavish—return to tradition, a regrafting, as it were, of our art on to its parent stock, by making the study of the great work of the past an indispensable part of every artist's education. At all events, one of the first necessities of the case seems to be the establishment of a more universal standard of taste, even among artists themselves, which can only be reached by much greater sympathy and co-operation than at present exists among them. Individualism has been allowed too free a play and originality has been worshipped for its own sake, with the result that little progress has been made towards the formation of a national style or of a body of tradition capable of guiding the future development of the country's art.

The other force which the authors consider to have militated against the movement is the modern industrial system. Division of labour is the keynote of modern production; but division of labour, when carried beyond a certain point, makes craftsmanship impossible and turns men into machines. The present tendency of commerce is to separate designer and craftsman, the object of the Arts and Crafts movement is to bring them together. Here is, perhaps, the most serious obstacle to progress, and one for which it is difficult to see any remedy except in such a gradual improvement in public taste as will lead the public to demand such a standard of work as can only be reached by the artist craftsman.

Whether these results can be obtained at all under present social conditions is a point upon which the Guild in the present pamphlet do not commit themselves, but they end with the following appeal to their fellow-workers :—

"We fully appreciate the gravity of the situation that has thus been created and the necessity for finding a solution to it. Indeed, in this connexion we feel ourselves in the position of commissioners in the Arts whose duty it is to investigate and collect evidence on these points.

"In these circumstances the Junior Art Workers' Guild will heartily welcome to its ranks all artists and craftsmen eligible for election who could lend a helping hand or who feel interest and sympathy with the efforts it is making to cope with the present situation. They feel that they should do something to organise the younger generation of artists and craftsmen, to bring together the best artistic thought of the day, and, where possible, to direct their energies into such channels as shall be most advantageous both to themselves and to the art of this country. In the accomplishment of this work they believe that it may be possible also to do something to arouse such a popular interest as will awaken the people to the ugliness of modern life, and that by taking in hand definitely the work of reform they will find a common ground of interest with the public, and so discover the artist's and craftsman's rightful sphere of influence and usefulness in the social system."

NOTES.

The Labour Market.

THE latest labour returns show some improvement for the month of March, but the building trade shows only seasonal improvement, the continued activity in other industries still leaves this untouched. The total number of workpeople affected by trade disputes which began or were in progress in March was 13,536 more than in the same month last year. The *Frankfurt Gazette*, quoted in the *Times*, April 18, gives some interesting figures in connexion with the German Labour Market, which in spite of the new tariff arrangements and a considerable influx of Austrian miners and Russian refugees, shows unusual activity, in which it is stated the building trade participates.

Roads Improvement.

FROM the annual Report of the Roads Improvement Association it is evident that the past year of this body has been one of great activity, and satisfaction must be felt that the House of Commons, some leading Government departments, and various local authorities have admitted the desirability of the recommendations made by the association in matters connected with the construction, maintenance, and administration of highways generally. The most welcome news contained in the Report is that a joint committee of the Roads Improvement Association and the Automobile Mutual Protection Association has been formed for the purpose of conducting experiments with the object of ascertaining the relative cost of constructing dustless roads, and the best materials for the purpose. Palliative measures have been found of little avail, and it has now been decided to lay experimental stretches of road with different materials, so that the effect of each can be separately studied. This work should be of much value to local authorities, as it will place at their disposal exact data as to the cost of dustless roads, and save them considerable outlay by rendering costly experiments unnecessary. In other countries investigations of the kind would be undertaken by the State, and it is really a disgrace that a private organisation should be compelled to act as an intelligence department in matters connected with the administration of the national highways.

The Petrol Nuisance.

CONSIDERING the rapid increase of motor vehicles in the streets of London it is quite time that more stringent regulations should be framed for the purpose of enabling the authorities to keep the atmosphere free from the fumes of petrol and lubricating oil. The petrol omnibus as at present made is a large and noisy contrivance, with a maximum capacity for the emission of noisome odours, but it is not the only offender. Petrol motor cars even of the most approved design are bound to leave behind them a distinct flavour, and it is certain that the promised supersession of horse-drawn by mechanically-propelled vehicles is not a thing to be desired, unless all forms of motive power other than electricity are to be prohibited. Existing laws are sufficient, if strictly enforced, to prevent the emission of steam and smoke from road locomotives of every kind, but they afford no protection against invisible vapour and smell. Of course, constant improvements in design tend more and more to mitigate the undesirable characteristics of petrol engines, but even assuming perfection to be attained, such machines would still generate quantities of carbon dioxide—small individually but enormous in the aggregate. Hence the adoption of electrically-propelled vehicles is much to be desired, and the promised introduction of the electric omnibus on a large scale comes as a most welcome innovation, although it remains to be proved whether the difficulties which have hitherto militated against the financial success of such ventures have been satisfactorily overcome.

Electric Lifts.

THE paper by Mr. Crews on "Lifts and Hoists" which was recently read before the Manchester section of the Institution of Electrical Engineers gives an impartial account of the costs of the working of twelve hydraulic and twelve electric lifts. The examples seem to have been judiciously chosen, and therefore the comparison he makes is instructive. The simplicity of the design and the mechanical excellence of hydraulic working compare very favourably with the motors, starting resistances, and complicated switches required for electric working. Yet, according to the author, at least five of the leading English makers supply three times as many electric as hydraulic lifts. The manufacturers recommend them as being equally trustworthy in working, and the maintenance contracts in the two cases are practically identical. From the data given in this paper it appears that the prime cost of an electric lift is greater than that of a hydraulic lift; but the cost of the energy required in the latter case is six times that required in the former. In an electric lift the power required is proportional to the load, but in the single ram hydraulic lift the power consumed is the same at all loads. The annual cost of the energy, however, for an hydraulic lift is only about a third of the annual total cost when maintenance, wages, and depreciation are taken into account. It will be seen, therefore, that if the electric lifts are more liable to breakdowns, etc., the saving in the power bill may be dearly purchased. Mr. Crews says that many electric lifts have been working satisfactorily for over ten years. The number of fully automatic push button electric lifts is rapidly increasing. In the case of one in use for over a year the working results are in substantial agreement with the figures given by Mr. Crews.

Professor Curie.

BY the untimely accident resulting in the instantaneous death of Professor Curie, France and the scientific world have suffered a great loss. Although recognised for many years past as an

investigator of unusual capacity, Professor Curie first became known to the general public in 1898 as the joint discoverer with Mme. Curie of radium. The remarkable properties which Becquerel showed in 1896 were possessed by uranium compounds, and the fact that certain uranium minerals were found to exhibit the quality of radio-activity in higher measure than metallic uranium, suggested to the Curies the probable existence of a new substance. Selecting pitch-blende as the material for examination, they proceeded in their search by methods of chemical analysis, and ultimately found an exceedingly small quantity of the radio-active substance now described as radium. Subsequent investigations showed, among other things, that radium possessed the extraordinary property of being able to emit heat continuously without perceptible diminution of bulk, and of transmutability into helium, thereby suggesting that the gropings of mediæval alchymists, ignorant as they may be considered, were not altogether based on folly. What further light the continued labours of Professor Curie would have been able to throw upon the hidden mysteries of nature no one can now say, but scientists in every part of the world have abundant reason for regretting the sudden termination of so exceptionally brilliant and valuable a career.

Abertillery Urban District. DR. WHEATON'S Report to the Local Government Board on the sanitary condition of the Abertillery Urban District seems to point to inadequate water supply as the most serious element in its unsatisfactory condition. The principal water supply is derived from the Tillery brook. From the intake the water passes to a small screening tank, and from this tank to filters; and thence to a clear water tank of 500,000 gallons capacity, from which it is distributed by gravitation. There are two of these tanks, but one is cracked owing to subsidence of the underlying strata, and cannot be used. The fitered water accumulates in the sound tank during the night, but is soon all drawn off in the morning, and at a time varying according to circumstances the supply becomes intermittent, the water running straight from the filters to the mains. Hence it is not surprising to read that with few exceptions water-closets are hand flushed, the water supply being insufficient to allow of the provision of flushing cisterns; it is also stated that the habits of the people are so rough that they would break any flushing apparatus provided in connexion with water-closets; and owing to imperfect flushing the hoppers of the closets are frequently found to be in a filthy condition. The Report recommends that the local authority should endeavour to provide an increased supply of water from a reliable source, and should also at once proceed to the appointment of a district surveyor.

Framework Knitters' Almshouses, London. THE freehold site of the old almshouses belonging to the Framework Knitters' Company has been placed in the market. The almshouses are situated in Kingsland-road, Haggerston, having a frontage of 200 ft. to the main thoroughfare, with a return of 87 ft. 6 in. to Pearson-street. The charity was founded in 1727 by Thomas Bourne, who bequeathed 3,000*l.* to the Company for the erection and endowment of an almshouse, and directed his executors to lay out not more than 1,000*l.* in the purchase of ground distant within 5 miles from the City of London, whereon to build an almshouse for twelve poor freemen, or their widows, and to invest the residue of the bequest in lands to yield profits for maintenance. The Company bought the land for 145*l.*, in a favourite quarter for institutions of that kind; they expended 800*l.* upon the building of a block with two wings, containing twelve tenements, and invested the residue in Old South Sea Annuities. Subsequent bequests made by Mrs. Staunton, the founder's daughter-in-law, T. Cook, and T. Taylor (1759-1854), on behalf of the inmates, in money and in kind, augmented the trust funds to the additional extent of 2,500*l.* The total income of the charity is given as 131*l.* 18s. in an official return rendered some years ago. A water-colour drawing by T. Hosmer Shepherd, 1857, of the almshouses is in the Crace Collection.

Lectures on Greek Dress. PROFESSOR BALDWIN BROWN gave at the Royal Institution, on Tuesday last, the first of two lectures on "Greek Classical Dress in Life and Art." The main object of the first lecture was to show that the Greek dress, as represented in sculpture and in vase-painting, was not a mere artistic convention, but was, so far as realism in sculpture could be allowed to go, an actual representation of the dress of everyday life; and to explain how this dress was put on—one could hardly say how it was made, as all the normal forms of it could be made by folding and fastening a rectangular piece of stuff. This process of folding, making up (as it were) the costume as it appears in Greek sculpture, was practically illustrated by a series of photographs from life, showing the process of folding and fastening in its successive stages. The Greek dress was, he thought, one of the most characteristic artistic creations of the Greeks, for the simplicity of its elements and the variety and beauty of its actual form and arrangement. From the illustrations of the process of putting on one gathered the meaning of two or three characteristics of Greek drapery which must be familiar to everyone who has looked at Greek statues, but the practical origin of which has probably often been overlooked. The second lecture will be given at the Royal Institution at 3 p.m. on Tuesday next.

The Baillie Gallery. AT the Baillie Gallery there is a mixed collection of works by Scottish painters—too many of them in what we call the "smudgy" style of landscape which is so prevalent now, and in which nothing seems to be distinctly made out; in Mr. M'Taggart's "Sunburst after Rain at Carradale" (7) there is hardly any distinction between the sea and the foreground beach or rock, as one must suppose it to be, on which figures are reclining who look as if they were in the water. There are some good effects here and there; Mr. Cadenhead's "September Afternoon" (3) for instance; Mr. Campbell Mitchell's "Aberlady" (10); Mr. Gibson's "Landscape" (22); Mr. Evan Geddes's "Winter" (52). Mr. Wynne Apperley's Venice sketches in water-colour are in the same unfinished style, but show good effects; the architecture is badly treated; no one has any right to paint a celebrated building in the way the Salute Church (78) is treated. A small collection of water-colours by Mr. Walter St. John Mildmay and Miss (?) Mabel St. John Mildmay show some good landscape effects, the lady's being the best; "The Coming Storm" (23) is a powerful sketch, and we like also "A Kentish Stream" (16), "A Venetian Canal" (29) and "The Mill Stream" (34).

The Fine Art Society. AT the Fine Art Society's Gallery there is on view a large collection of old engravings of Oxford and Cambridge and of the Public Schools, not valuable mostly in an artistic sense—indeed, in the majority of them the buildings are very badly drawn, but of no little interest in a historic and topographical sense. With this collection is united an exhibition of a series of water-colour illustrations of Oxford and Cambridge as now existing, by Mr. Wallace Rimmington, and a smaller collection by Mr. W. Matthison. On the whole we prefer Mr. Matthison's in point of colour; but both sets form an interesting collection of illustrative water-colour art.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

MR. E. T. HALL presided on Monday over the fortnightly meeting of the Royal Institute of British Architects held at No. 9, Conduit-street, W.C.

Mr. Alex. Graham, Hon. Secretary, announced with regret the decease of Mr. R. A. Bryden, of Glasgow, Fellow, elected 1878, and Mr. W. Goldsmith, Associate, elected 1882.

Plaster-Work.

Mr. Geo. P. Bankart and Mr. Laurence A. Turner then read papers on "Plaster-Work," of which the following are abstracts:—

Mr. Bankart said that plaster had so long been looked down upon for its modern commonplace vulgarity of treatment that it seemed almost incongruous to think of it as a vehicle of art. Any really healthy revival seemed only seriously possible by again reverting to the beginnings, by the gleaning of some of that simple impulse which urged the artists of the past to find expression in materials and methods most in sympathy with their own nature, and in the right and full development of those methods.

What, the author asked, are some of the abstract points of value to be gathered from a general rumination amongst all the accumulated wealth of the labour of men's hands in the application and shaping of a kind of mud in or on buildings; and what may we rightly take to heart in pursuing or in attempting to give fresh hope and vitality to modern plaster-work? The shadow of the first half of the first century A.D revealed to us remnants of modelled wall and ceiling decoration of a beauty, subtlety, and delicacy never since surpassed or even approached. It spoke to us of the extraordinary decorative instinct of the Greek and Roman in the combination of extreme simplicity of line and surface with refinement and power of execution. For the plasterer the lessons to be learned from these fragments of decorative art can never be too plainly noted or too highly praised. The stucco of the Romans tells us of their investigations, their admiration, and of their imitation. This imitation

was not the copying of the form, but of the spirit, of the art of the ancient Romans and Greeks. We of the XXth century have our own religion, our science, our folklore, our national virtues, our industries and manufactures, to embody in our art.

Tracing the history of the plasterer's art through Renaissance times, and speaking of the results brought about by the changes in building construction, the author demonstrated that each one of these developments had its marked effect upon the decorative art of the plasterer. From each of these stages it would be found that the plasterer produced his best work when the particular kind of plaster he used, whether stucco, parge, or plaster of Paris, was worked in its own particular plastery way, and was not forced into simulation of carving in marble, stone, or wood. The success of his art seemed best assured when his material was put to the fullest right use without abuse.

To the question, Did the Classic or the Renaissance architect consider whether the methods then employed were legitimate or no? the author was inclined to suggest the negative, but that they were accepted as the most convenient and durable methods of expression then known. The primary object of the decoration of a ceiling or of a wall, as in all decoration, was the giving of pleasure to the eye. The construction of the ceiling had undoubtedly its bearing on the design, but once the impression of sufficient support and strength satisfied the artist, he vied in his emulation to obtain the praise of the patron (eager to outshine his rivals); and to do this, while framing his work with due respect to reasonable economy, he thought chiefly of his enrichment, treated in the language of the time. This point concerning right or mistaken method, whether past or present, had an important bearing on all workmanship. Had the artists of the Italian Renaissance known of the method of casting from moulds of flexible gelatine, the author thought that they as artists would have carried their method to a much greater pitch of perfection, and not so much in mechanical skill as in suiting their forms more particularly to the advantages of the mechanism. He claimed for plaster at least that respect and technical liberty which is due from the artist to any other material or medium of expression, whether the surface of operation be large or small. He believed each period of the art of the plasterer should be regarded on its own merits in combination with the peculiar circumstances and efficiency or inefficiency existing, according to the peculiar materials that it was then most convenient to procure and to manipulate. If mechanical skill be the plasterer's diploma, then should the XXth century be able to dim the glories of the Italian Renaissance; but we must go back again to simplicity of line, of form, and of spirit, in the giving of pleasure, with our money's worth. If this object is unattempted and unaccomplished, or undesired, by the lack of desire or knowledge of the sense of beauty on the part of the people and of the worker, then the world will be so much the poorer by ignoring, not only the art of the plasterer, but all of the lesser arts.

Mr. Laurence A. Turner took for his subject "Decorative Plaster Ceilings," which he divided into two broad divisions—lime plaster and plaster of Paris. These two materials, he said, required widely different methods in their use. As to which gave the most satisfactory plasteresque result there could not be two opinions. Lime plaster must take the first place, and ceilings in this material must be modelled *in situ*. The quality we should try to reproduce in plaster-work is that which we find in the Elizabethan and Jacobean lime-plaster ceilings. These form the best models and standard of work for the art. Most are of lime-plaster; but there is no reason why the same effect should not be produced with plaster of Paris. The chief quality that made the old plaster-work so charming was the exceedingly soft, delicate, and subtle play of light and shade that was produced on its modelled surfaces. In modern work it is the hardness of line and sharpness of shadow, dead flatness of the unornamental surface, that make it so dreadfully dull. The most satisfactory results in any plaster-decoration we possess are those in which there is no undercutting except in detached ornaments. Therefore, it is necessary, in modelling a ceiling, to avoid all undercutting, hard edges, and rigidity of line. Court everything that is the reverse of these qualities—softness, rounded contours, soft shadows, breadth of surface, and extreme modulation of line and surface. Plaster-work worthy of the name must have the quality of softness. Every atom of it should be modelled. There should be a subtle play of light and shade all over it; the plain spaces as well as the mouldings and foliage should be alive with delicate modelling, and not dead and cold like the early Victorian ceilings. With the many new methods and materials discovered since that Utopian period for plasterers between 1400 and 1600, what can be done, the author asked, to produce a fine, satisfactory, decorative result at a reasonable cost? To make a ceiling nowadays in lime-plaster, using only the methods that those old people used, it is useless to imagine that anything can be done that is not very costly. Besides, the difficulty of obtaining the properly-slaked lime renders it almost impossible to model the plaster with the fingers. Tradition says that twenty years was not an out-of-the-way time for the lime to be slaked before use. The author advised the use of Keen's cement if well-slaked lime was not procurable. In ceilings he had modelled *in situ*, in which Keen's cement had taken the place of lime, he had always mixed silver sand and size with it, the latter to prevent the cement from setting too quickly. He did not personally incline to the method of modelling in plaster *in situ*. He preferred to model the ceiling on the bench, in Keen's cement and sand, and to use his fingers only. When the model is finished a mould of plaster of gelatine is made from it, and the work cast in fibrous plaster. If there is a doubt about the amount of relief required, it is easy to offer up a cast *in situ*, and there is the advantage of being able to repeat the pattern instead of having to model the whole ceiling. Another advantage is that, by using sand with the cement, one can by using a coarser sand, and more of it, prevent the work from becoming too small in detail or too elaborate in finish, for the material will not allow of it. Another advantage of fibrous plaster over lime is that the ceiling is three or four times lighter, and will not crack or fall, as the lime plaster on lathes sometimes does. The author confessed his partiality for ribbed or panelled ceilings, the method of construction of which he described in detail. Their beauty is chiefly dependent upon the modelled effect they should possess, the ever-varying play of light and shade of a most subtle kind. Very great care must be taken in modelling the plain ground for this type of ceiling, as the richness of effect is chiefly dependent upon it. The practice of using moulded wooden ribs, dividing up a ceiling into panels and painted white to appear like plaster, he strongly deprecated. It had the result of bringing a ceiling down and making it look heavy, whereas a well-modelled ceiling of plaster does the reverse, making the room look lighter and giving a sense of greater space.

The ceilings of Wren's date, although very beautiful, depend upon their design for their beauty, and not upon that quality which is peculiar to plaster-work. They might equally well have been carved in wood or plaster. The Adams' ceilings, made, the author believed, entirely from carved-wood moulds or carved wooden models, are hard and uninteresting, though very refined; they depend for effect entirely upon their design, and not upon modelling.

With regard to the question as to how far the architect should supply drawings for a ceiling, the author thought that nothing more than a small-scale drawing indicating the type of work he required should be given to the modeller; more than that only hampered him. The architect should supervise and criticise the models, but unless the modeller did the details himself the result would probably lack life and freedom.

The author, in conclusion, emphasised his view that if a plasteresque effect be wanted, the whole ceiling should be softly modelled, mouldings as well as ground; but if that was not to be, then let it be, frankly, carving produced in plaster.

Professor Baldwin Brown, in proposing a vote of thanks to the readers of the papers, said that a great many points must have occurred to everyone present, but he himself would only touch on one or two. The historical point of view of the question had not been dwelt upon so much that night as had been the case in previous lectures, but there was no doubt that the history of plaster-work was of very great interest, because the most ancient nations were perfectly familiar with the material, and used it for building purposes; but they did not apparently realise its artistic properties. The prehistoric Greeks, however, as one knew from the remains of modelled plaster-work found at Knossos, had a knowledge of artistic work in plaster. The later Greeks used terra-cotta where we now used plaster in decorative work. There was no doubt that the idea of the work at the Villa Farnesina at Rome came from the Greeks. He thought there could be no doubt that the work was elaborated at Alexandra, like so many of the technical details of building, and came into vogue afterwards in Rome; and that which we called Imperial Roman was really Greek adapted or imitated by the Romans. The subject of the modelled panels in the work of the Villa Farnesina was like those of sculptured reliefs which were known to be Alexandrian, and, as a matter of fact, some wall-paintings found in connexion with these plaster ceilings had Egyptian or Alexandrian subjects, which proved the case. As one saw it both in the Villa Farnesina and in the Tombs of the Via Latina, the plaster-work hardly came up to the ideal which the lecturers had put before them—that there should be the same quality of handling for the whole of the ceiling, both for the figure parts and also for the mouldings. He thought the Roman or Greek work was partly cast from moulds, and it seemed to him a little incongruous that in the beautiful work of the Villa Farnesina the mouldings were rigid and obviously cast-work, while the other part of the work was modelled with extreme freedom by hand. There was a gap in the history of plaster-work which might be filled up, for it seemed to have reappeared again in the XVIth century as a consequence of the discovery of so many Roman buildings at that period which were decorated in this fashion, and the work was reproduced by many persons. As a matter of fact, there was no break in the history of modelled plaster-work, and there were some extremely fine examples of mediæval plastering. One of the finest was at Cividale, in the extreme north-east corner of Italy. In an old chapel there there was some extremely fine and bold modelled plaster-work, consisting of figures in very high relief and of about two-thirds life-size, and one might do worse than make a pilgrimage thither for the purpose only of studying this particular piece of work. It might date about 1100, and would, without doubt, be of the same period as that very interesting stucco screen in the church at St. Michael's, Hildesheim, Germany, where, again, the figures were about two-thirds life-size, modelled in high relief with bold foliage-work. Those examples of mediæval work showed that the art was alive. One matter about which he would like to ask a question was with regard to a recipe for preventing the plaster drying too rapidly, which was the mixing of baked meal with the plaster. There was a reference to it in regard to the plaster-work at the Palace of Nonsuch, and the late Mr. Robinson, who was so well known in connexion with plaster-work, said that he tried that material and found it worked very well. He said that the plaster remained plastic a long time under the fingers, and when it dried it gave a very fine old ivory tint. He would like to know whether the readers of the papers had tried that material to prevent the plaster drying too rapidly. He was glad to hear lime plaster vindicated as being a finer material for working than plaster of Paris, and there was one use of lime plaster about which it occurred to one to say a word. If they read the earliest accounts they had of plaster-work by Vitruvius, they saw that the finish of plaster-work was of two kinds. The material was made of pounded marble mixed with lime, and Vitruvius spoke of "ten men with macerating rods carefully macerating the plaster for a long period of time." He did not know what effect this continual maceration of the material was supposed to produce. At any rate, the material was of such excellent quality,

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and gave such a fine surface, that no additional treatment was necessary. And then another way was to apply to the plaster immediately it was finished a coat of pigment mixed with water, so that the whole work dried together. This was what was familiarly known as the fresco process. Now they all spent the greater part of their lives within plastered walls, and they as a rule treated these walls either by papering, by oil-painting, or by distempering, and none of these was a really satisfactory way of finishing the plaster-work. In each case an additional material was put on and hid the plaster, and neither the paper nor oil-painting could be properly cleaned, while the distemper could not be cleaned at all. Further, two or three processes of sizing and two or three coats of paint were required. Supposing as soon as the plaster was laid a coat of simple colour mixed with water was laid evenly over it when wet, then, according to the chemical processes with which everyone was familiar, the colour would be crystallised on the plaster, and would remain as a permanent finish to it. He thought everyone would agree that there was no surface so pleasing to the eye as a coloured surface produced by fresco, and it was the quickest and most beautiful way of colouring a surface. There was no doubt that people grew frightened of fresco-painting, as a great deal of fuss was made over it in connexion with the walls of the Houses of Parliament, but the colouring of the surface and the painting of a picture were very different. He hoped that when the Institute got its new building some of these experiments would be tried. It might be tried in a corridor, and they could see if they could restore this old process, which was perfectly familiar in ancient times.

Mr. Atkin Berry seconded the motion, and thanked the lecturers for the comprehensive way in which they had dealt with the subject.

The Chairman said they had had interesting papers on a subject which had a great fascination to every architect. The historical sketch which was given them by Mr. Bankart was very interesting, and he had referred to the remarkable plaster-work in the Temple at Knossos. They must all have been struck by the views which were presented to them by the excavator of Knossos some years ago in that room and with the wonderful paintings, which were interesting as examples of plaster-work, and also as representing to them a civilisation of which they had practically no knowledge until these buildings were discovered. Professor Baldwin Brown had given them a description of various adaptations and applications of plaster, and had told them that there was no cessation of this great art, but that it passed on through the centuries until they saw its great display at the beginning of the XVIth century. Indeed, wherever there was a classical art they found that it had never been absolutely lost, but they found it cropping up in most unexpected corners. Their attention, however, was only drawn to it when they saw an exceptional display, as was the case with plaster-work at the period of the Renaissance. It had been suggested that in the building which the Institute was going to put up they should make experiments. He was not quite sure whether experiments were very desirable things when they were building their own home, because if there were failures he was afraid the public would simply think they were failures through their absolute inexperience and ignorance of the profession in which they were practising, and would not give them any credit for having tried to follow Professor Baldwin Brown in his suggestion with regard to the treatment of plaster when it was wet. One of the great difficulties which faced them in dealing with wet plaster was that they were so limited in the shades of colour they could use. They could use yellows and reds, but not greens and blues, and therefore they had a very limited field. He believed that many of them in their humble way had tried to carry out the suggestion of Professor Brown. He had himself, and found his clients dissatisfied with the result, because he had endeavoured to get some shade a little less common than yellow and red. He thought they were all grateful for the series of photographs on the walls. They could recognise in many of them their influence on the brothers Adam and other men of the period. Such a display of photographs showing the methods of the past would serve to inspire those of the present day to try and attain equally beautiful results.

The motion having been heartily carried,

Mr. Bankart said he had little doubt but that the early work of which they had seen the mouldings and the more mechanical parts dividing the panels were cast from moulds of some kind, but the panels themselves seemed to suggest that they were modelled almost *in situ*, and the surface-work seemed clearly to indicate that they were entirely the work of a free hand. Professor Baldwin Brown had mentioned some of the mediæval work, and Violett le Duc mentioned some work in France during the Carlovingian Period which was also modelled in stucco, practically speaking, from the receipt given by Vitruvius. He mentioned it in a rather beautiful way, and said that this work was extremely slight, and merely to cover the bareness of the walls. That such work was going on in France during the Carlovingian Period there was no doubt. With regard to the question of ingredients being used with stucco, they had it on record that hog's lard and blood and common beer were used to retard the setting, and Vitruvius mentioned that the pounding of the lime for a long period was done chiefly to break up any particle which was not properly slaked. As regarded the colouring of plaster-work, he believed that nearly all the old stucco plaster-work that they knew to be coloured in fresco, as they called it, was done with fine tempera-colour. At any rate, in the old Italian work about which Mr. Sumner read a most interesting paper before the Society of Arts, he gave a very interesting account of how the colouring was used in the old days, and how it was mixed with the liquid plaster, and how he himself mixed the different colours (mostly yellows and reds), and how extremely difficult it was to make use of blues. Mr. Sumner mentioned one blue which it was possible to use, the name of which he (the speaker) could not remember for the moment, but it was a mineral colouring of some kind.

Mr. Turner also responded, and said that the photographs belonged to Mr. Bankart. He had come there that night to learn, and would have liked to have heard Mr. Bankart tell them something of how the early men made their ceilings. It would be extremely interesting if some expert would write an account, as far as he knew, of how these old plaster-ceilings were made. He was inclined to think that they must have had other methods than those which, so far as he had read, were ascribed to them, and it was strange that they had not a single example remaining of the tools which were supposed to have been used. As regarded the treatment of the surface of plaster, one thing he had done to plaster ceilings after they had been fixed was to give them a coat of turpentine and beeswax, which gave a nice ivory tint, and also enabled the ceiling to be afterwards washed. They could not make the mistake of putting on too much, because the plaster would only suck up a certain amount, and they could not do more. He had in a small way tried to colour plaster of Paris casts, and a delightful method of colouring could be done by using simple oil-colours and turpentine. One could not, however afford to make a mistake, for the plaster would only take one wash, and directly one tried to put on a second coat one got an opaque colour. With one wash they got the quality of water-colour on a piece of white paper—the white paper showed through the colour and gave a quality which could not be reproduced in any other way. He had made no experiments with meal. His experience had been almost entirely with plaster of Paris and a substitute for lime-plaster, because they could not get the lime properly slaked. He had referred to a village in Italy where the villagers slaked their lime for a long period, and he was told that the lime was slaked wet and was not sifted. They only used the liquid plaster which exuded from one pit and flowed into another.

The International Congress.

The Chairman announced that the annual general meeting would be held on May 7 for the presentation of the annual Report and the transaction of other business. Previous to that meeting there would be a special general meeting, when the Chairman would bring forward a resolution proposing that the present President and Council should retain office until the conclusion of the Congress to be held in July, and that by-law 30 be temporarily suspended in order to allow that to be done. They would all recognise that it would be an inconvenient and almost impossible position that the Council which had charge of the great International Congress should be a new Council coming in at the very last moment. The present Council had had all the labour of the arrangements for the Congress, and it would be in the interest of the Institute and in the interest of architecture that those who had had the arrangements should remain in office until the conclusion of the Congress.

THE NEW GALLERY.

THE exhibition at the New Gallery does not include any work of the highest order of interest, but, among a certain proportion of weak and doubtful pictures, there is a good deal that is well worth attention. Perhaps the strongest works there are two portraits, that by Mr. Lavery of the Earl of Plymouth (143), and that by Professor Herkomer of General Palmer; the first notable for the fine and subtle colour which the artist has contrived to make out of an ordinary country costume; the second remarkable not so much for colour as for simple and vigorous characterisation. Mr. Hughes-Stanton's large landscape at the top of the north room, "Sand Dunes, Dannes-Camiers" (221), may also be singled as something exceptional in English landscape-painting for its large scale and monumental style; it is the kind of landscape one expects to find in the Salon rather than in an English exhibition, and it is certainly the most important work by this artist that we remember to have seen.

The South Room, in which the numbers commence, contains no figure picture that is really important except for its size, beyond a very charming half-length portrait of a lady (68) by Mr. Lavery; Mr. P. A. Hay's ideal personage "When Vanity Sleeps" (6) is too long in the neck, though there is something in the work, and the neighbourhood of "Rannoch Bridge" (9) by the same artist is at all events an evidence of versatility. There are some very good small landscapes. Mr. James's "Approaching Storm" (4) and Mr. Fisher's "A Lane—Antibes" (5), hung close together, illustrate by contrast (perhaps intentionally on the part of the hanging committee) two altogether opposite methods of regarding landscape; the first as imitation of nature (in this case by no means as commonplace as such imitations often are), the second as translation of nature through the medium of a special technique peculiar to the artist, and which precludes all idea of illusion. Mr. W. H. Bartlett sends two of his admirable Irish coast scenes; "From an Island in the West" (10) is a fine bit of sea-painting of rather unusual style; "For Island Pasturage" (14), the finer work of the two, is an admirable landscape composition. In Mr. Thorne Waite's "Children of the Downs" (18) the foreground and figures somehow hardly seem to belong to the middle distance, at least in colour and execution; they come into the composition all right, but have a kind of appearance of having been put in by another hand. Mr. Hill's "Evening on the Arun" (28) is a landscape of artistic completeness of feeling and composition: Mr. Arnold Priestman's "Heather Burning" (46), though a small work, is something more than that, showing not only composition and unity of design, but an effect of landscape gloom portrayed with great power—a picture which is a landscape poem, very different from the crude lumping together of dark masses of pigment in "A Cornish Valley" (56) by Mr. Peppercorn, whose work of this kind has become a fashion among art-critics, but will not take in those who have saner judgments than the art-critics of the present moment generally display; this kind of landscape convention is a very easy one, and there are plenty of other people who could do it if they thought it worth while. This cannot be said of Mr. Ernest Parton's convention, as illustrated once more in "Autumn Leaves" (49): this is delicate and highly finished and

entirely his own; but then it is so very conventional, and has been so often repeated.

In the West Gallery Mr. Melton Fisher's "Mrs. T. C. Bowen" (85) is a half-length portrait noteworthy for its delicate delineation of character and for fine colour; Mr. Coutts Michie's half-length of "Mr. Idris" (95), in some kind of official costume, is a very dignified portrait; Sir George Reid's of "Sir John Glover" (139), Chairman of Lloyd's, is of the best class of what may be called "Board-room portraits," which must be done, and should therefore be well done, but are not the most interesting contributions to a picture gallery, to those at least who have no personal or official interest in the subject of the portrait. Mr. Clark's attempt to emulate Watts in "Spiritus adversus Carnem" (163) is as ambitious and as unsuccessful as Mr. Dicksee's similar attempt in last year's Academy—

> But Watts's magic could not copied be:
> Within that circle none durst walk but he;

at least, if they dare, they are likely to come to grief. Mr. Austen Brown's "A Haymaker" (141), which looks rather like an inspiration from Millet, loses the effect of what is in the main a good picture by the want of strength and precision in the treatment of the head; a weakness still more evident in his other single-figure picture in the north room, "Meadow Flowers" (194), where modelling of the features is so curiously evaded that the figure suggests a ghost rather than a flesh-and-blood personage. Mr. Wontner's "In the Garden of Dreams" (115), on the other hand, is too hard and over-finished, a kind of furniture picture which may assist in decorating a room but leaves nothing for the imagination. The most really artistic conception among the figure subjects in the west room is Mr. Henry's "The Hourglass" (97), a title which serves to give, from one of the accessories, a distinguishing name to what is simply a piece of beautiful composition in drawing and colour, to which the spectator may attach any fancy that he pleases; in spite of its unsuggestive title, this is a really poetic work, which "The Garden of Dreams" (in spite of its title again) is not—there is no suggestion in it but of painstaking workmanship in a rather hard style. Mr. Llewellyn's "Bedtime" (112), where a half-length figure moves across a window which forms the background, carrying a sleeping child in her arms, is pleasant both in sentiment and in its broad and well-balanced execution.

In this room is the largest but hardly the best of Mr. Wetherbee's contributions, "Dawn at the Gate" (90), where the effect of the morning light breaking, as if the farm-yard gate were being opened to admit it, is most fresh and charming, but the calves in the foreground seem singularly stiff and wooden in their structure. Mr. Wetherbee's real gift is shown in his smaller but beautiful picture in the north room, "Jocund Day" (203), one of the idylls of rural life in which he mingles so well the real with the ideal. Among the other landscapes in the west room is a spring scene by Mr. Edgar Barclay, "Amidst Winter's Wreckage" (84), which is full of sunlight, and should have been hung on the line, where various works of quite inferior value have found place. A small landscape by Mr. H. W. B. Davis, "Gloaming" (102), is noticeable especially because he has contrived to give a radiance to the moon without exaggerating her size; the majority of moons in landscape-painting are too large, as painters would find out if they would take the trouble to calculate what angle the width of the moon really subtends in the arc of the sky, and how many degrees of arc they are including in their picture: to find a moon really no more than the relative size of nature is an incident to make a note of. Mr. Thorne Waite's "Cornfield near Arundel" (111) is in a different and more vigorous style of execution than is usual with him: perhaps the sky is a little too restless, but it is a good picture. "The Old Garden at Tivoli" (130), by Mr. Harold Speed, is a moonlight effect in which the moon does not, however, appear; it is an interesting and very clever attempt at a difficult effect. We have before referred to some of the architectural pictures which Mr. Sydney Lee has taken up as a special class of subject: he is making something very good out of this: his picture here of "The Belfry" (131), a simple rough-cast country church tower with the upper portion in sunlight, is excellent; even the churchyard wall is made pictorially interesting. Further on we come to a small but exceedingly fine seapiece by Mr. Hemy, "The Bell Buoy" (150), one of the most real pieces of sea-painting we have ever seen. Mr. Brangwyn's large picture entitled "A Wine Shop" (167) is merely a very powerful piece of still life painting; it may be a question whether the subject was worth the extent of canvas bestowed on it. Mr. Talbot Hughes's "Music and Moonlight" (177) shows a young couple in evening dress in the moonlight on a terrace, beside an open door through which the sound of the music may be supposed to be heard; a clever picture both in light effect and in the graceful and *spirituel* figure of the lady.

In the north gallery Professor Herkomer's rather flaring portrait of a lady in bright blue dress (216) is conspicuous—rather too conspicuous; we prefer Mr. Melton Fisher's severe and monumental portrait of a lady in black (226). Mr. Hugh Rivière has a fine seated portrait of Miss Genevieve Ward (240), the face painted with great power; and Mr. Coutts Michie exhibits a three-quarter length of a beautiful girl in a crimson dress partly covered by a cloak, under the title "Ruby" (154). But one of the most interesting and characteristic figure paintings in this room also is one by Mr. Henry, "Summer Morn" (258), a life-size painting of a young lady at an open window, through which the summer landscape is seen; this is a picture quite out of the usual run of such things; there is a bright sprightliness and life about the look and attitude of the figure which is admirably imagined. Mr. Draper's small allegorical painting, too, "Art and the Jade" (220), should not be overlooked; "the jade is Fortune with her wheel, whose half-nude figure appears as a vision behind the wandering artist seated in the foreground; it is worth attention both for idea and execution.

There are several fine landscapes in the north room, besides that by Mr. Stanton-Hughes already referred to: Mr. Hetherington's "Life on the Marsh" (188), with a grand warmly-tinted cloud hanging over the flat Norfolk country; Mr. R. W. Allan's "The Grey North Sea" (207), almost a repetition, on a larger scale, of one of his works in the Society of Water-colours Gallery—on the whole we think the water-colour is the finer of the two; Mr. J. R. Reid's small coast scene under the title "Lobster and Crayfish" (215); Mr. Alfred Withers's "Moret—Evening" (238); Mr. Coutts Michie's "On a Lonely Moor" (247), a landscape in a simple broad style of design which reminds us rather of Georges Michel; and Mr. Adrian Stokes's "The Great Plain of Hungary" (257), with its curiously characteristic ragged trees and an admirably painted foreground. We should not have omitted to mention Mr. Hornel's "Burning Leaves" (199), which, for those who like pictures that look as if they were an inlay of pebbles with the figures let in flat, is worth looking at; we do not like the school, but in its way it is perhaps the best thing this artist has produced.

Among the sculpture exhibits in the Central Hall is one which has considerable interest for us—Mr. Natorp's blocked-out model of the Hyde Park screen with a quadriga on the central pavilion and figures of a man with two horses on each of the lesser ones: the sculptures being supposed to be bronze gilt. The work would be a fine addition to the screen, and we should be only too glad to think that there were any chance of its being carried out. The sculpture collection as a whole is not very important, but there is a charming fancy by Miss Esther Moore under the title "Youth's Dream of Joy" (531), of which we shall be able to give an illustration, the only way to rightly explain it. Mr. Tweed's "Latona" (531) is a well-modelled nude, though why the mother of Diana should be shown in this ungainly crouching attitude is not very obvious; it looks rather like a classic title given to what was merely a Life Study. There are three pretty statuettes by Mr. Derwent Wood intended as sketches for Garden Statues (523-5), and a panel by Mr. Roscoe Mullins, the centre of a memorial (503), a figure in relief and a heraldic shield which combine in very decorative lines, and which is worth a better position than has been given to it.

ACCIDENTS FROM MECHANICALLY-DRIVEN VEHICLES.

QUESTIONS have recently been asked in the House for returns as to accidents caused by motor vehicles, and the figures are interesting. In the cases ending fatally some returns can be obtained through the Registrar-General, but the figures as to non-fatal accidents are more vague since no notification of accident is compulsory, and the accidents of which figures can be returned are only those notified by the police. Seeing the danger incurred by the multiplication of faster vehicles it is time compulsory notification of accidents was introduced. The Legislature shows a curious indifference on this subject in strange contrast to the grandmotherly legislation in relation to factories and where workmen are concerned.

The figures given by the Home Secretary for England and Wales of fatal accidents were the following:—For the years 1903—Motor-cars, 39; motor-cycles, 13; electric and steam trams, 65; traction engines, 19; motor-wagons, 1; steam rollers, 4—total 141. The figures for 1904, for vehicles in the above order, were—59, 16, 54, 29, 9, and 5; the motor-omnibus also appeared and caused two deaths, making a total of 177 deaths. The Parliamentary Return of 1904 up to April, gave the number of motor-cars in the United Kingdom as 14,887; motor-cycles, 16,534—total 31,421. The total number of accidents known to the police to persons and property for the first three months of this year from motor-cars, motor-cycles, and motor-omnibuses was 1,726; if this first quarter of the year can be taken as representative this would show the number of accidents in the year to be about 5,278, or about one accident to every six vehicles, but, allowing for the increase in the number of cars and cycles, say, one accident to every ten cars and cycles. The total number of street accidents attributable to horse-drawn vehicles in the year ending April, 1904, was only 22,558, 7,921 being accidents to persons. The strict legislation for the protection of persons in steamships, railways, factories, and workshops will become an anomaly if the dangers of the streets are to increase and be perfectly neglected.

ART UNION OF LONDON.

MR. J. MACKRELL presided on Thursday, at the rooms of the Society of Arts, Adelphi, over a general meeting of the members of the Art Union of London to receive the report of the Council, and for the distribution of prizes of works of art.

Mr. F. L. Marriott, secretary, read the seventieth annual report, which stated that the commission to Mr. W. L. Wyllie, A.R.A., to make an etching of his "Trafalgar" painting as the plate for the year had been amply justified by the appreciation with which the work had been received. The entire Remarque proof issue was subscribed for within a few weeks of publication. The Council had again selected a few small water-colours of special merit for inclusion in the prize list, and it was hoped to make this a permanent feature. They were considering how far it might be possible for them to include the products of the sculptors' art amongst the works issued by the Union at a scale of subscription that might bring them within reach of all. Unusual interest belonged to the plate for the coming year. The picture from which it was taken, entitled "Day Dreams," by Mr. W. R. Symonds, was exhibited in the Royal Academy in 1904, and had been purchased by the Council with a view to its adoption as the first prize in the next distribution. They were fortunate in securing the services of Miss E. M. Hester to engrave the plate. In deciding upon the issue of this plate, the Council were not altogether uninfluenced by the wish to mark the happy revival of mezzotint engraving, which was becoming increasingly apparent. They trusted that the election of two engravers by the Royal Academy might materially help forward the realisation of the National School of Engraving which the Council had so much at heart, and which it was hoped the Academy might see their way to undertake. The Society's supporters in Canada were still debarred from any share in the prize distribution, but the Council were by no means allowing the matter to rest.

Dealing with the year's art, the Council congratulated the National Gallery on the Venus and Cupid known as the Rokeby Velasquez and also on having commenced the rearrangement of all the Turner drawings. The National Gallery of British Art had been enriched by the purchase of 116 sketches and studies by Alfred Stevens and by other works of art. The National Portrait Gallery was fortunate in having been able to purchase the splendid crayon portrait of William Cooper, drawn by Romney. Reference was also made to the additions to the Victoria and Albert Museum and the British Museum, and to the exhibitions of the Royal Academy and many other exhibitions both of a public and private character in London and the provinces.

The Chairman, in proposing the adoption of the report, remarked that no more important picture had been exhibited than that of Mr. Wyllie of last year, and proceeded to give some of his father's recollections of the state of things in the country at the time of the battle of Trafalgar when an invasion by Napoleon was daily expected. With regard to the attempt of the Society to revive mezzotint engraving amongst their works of art, he trusted it would be appreciated by the public and would tend to increase their subscriptions. The depression in trade had not helped the Society, but still they had done better than last year.

The report was adopted.

The draw for the 106 prizes was then proceeded with. The first prize of 100 guineas was won by Mr. R. C. Willis, of Palmer's Green.

Architectural Societies.

GLASGOW INSTITUTE OF ARCHITECTS.—The annual general meeting of the Institute was held in the rooms, 187, Pitt-street, Glasgow, Mr. John Keppie, F.R.I.B.A., President, in the chair. The President referred to the death of Mr. R. A. Bryden, F.R.I.B.A., who was one of the original members of the Institute, having joined in 1868, and it was agreed to minute an expression of deep regret. The secretary submitted the annual report, which stated that during the past session the Council had been actively engaged with the arrangements in connexion with the scheme for amalgamating the Glasgow Architectural Association with the Institute. The attention of the Council was called to the undue proportion of unpaid apprentices employed in many architectural offices, and, as the matter was considered of special urgency, a circular calling attention to this was issued to the members of the Institute, asking them to adhere, as far as possible, to the practice of employing one apprentice only to each draughtsman. The Council desired to call attention to the facilities for study which were available in the recently-established "Glasgow School of Architecture," conducted by the Technical College and the School of Art. With reference to the reconstruction of the Royal Infirmary, the report stated that the proposal to employ terra-cotta had, it was understood, been departed from. The report was adopted. The President, in his valedictory remarks, referred to the subject of registration as perhaps the most important matter before the architectural profession at the present time. Although the scheme for amalgamating the Glasgow Architectural Association with the Institute had not yet been formally carried out, he hoped the matter would be completed at an early date. The Council for the ensuing year was elected as follows:—Messrs. A. N. Paterson, John Keppie, H. K. Bromhead, James Lindsay, T. L. Watson, James M. Monro, Alexander M'Gibbon, Andrew Balfour, Charles Gourlay, Thomas Baird, jun., R. D. Sandilands, George Bell, Alexander Skirving, Robert Miller, John B. Wilson, and H. E. Clifford. The treasurer's accounts, which were submitted and approved of, showed that the funds were in a satisfactory position. A meeting of the newly-elected Council followed, at which office-bearers for the year were appointed, viz.:—President, Mr James M. Monro; Vice-President, Mr. George Bell; Auditor, Mr. Alexander Skirving; Secretary and Treasurer, Mr. C. J. MacLean. The various committees for the year were also appointed.

MANCHESTER SOCIETY OF ARCHITECTS.—By the annual Report of the Council (the forty-second) we learn that the Society now counts 223, an increase of 4 since last year. The Report refers specially to the legacy of the late Mr. Mills to the Society, which included 8,000*l.*, to be set apart and invested so as to produce so far as practicable a certain and permanent income therefrom for the benefit of the Society; and Mr. Mills further provided that his trustees should select such of his plate, plated articles, books, pictures, prints, statuary, bronzes, linen, china, glass, furniture, and other articles of household or domestic use or ornament as will be suitable for the purpose of furnishing a building or rooms for the use of members and students of the said Society or suitable for ornamental or instructive purposes in any building or buildings belonging to or under the control of that Society or for any such purpose. The Council has received from the trustees of the late Mr. Mills the articles selected by them, which are of the value of about 1,000*l.*, and are now stored till arrangements can be made to obtain suitable premises for the use of the members; a committee has been appointed with this object, and is now engaged endeavouring to find premises.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The annual meeting of the Association was held at 117, George-street, on the 18th inst., Mr. H. O. Tarbolton, the President, in the chair. The Chairman of the Committee of Management reported that 1907 would be the jubilee year of the Association, and it had been suggested that the event should be celebrated by holding an exhibition and inviting the Royal Institute of British Architects to hold their annual dinner and other meetings in Edinburgh that year. Mr. J. T. Baillie moved that Mr. Hippolyte J. Blanc, R.S.A., be appointed President for next session. Mr. W. T. Oldrieve, H.M. Office of Works, seconded, and the motion was unanimously agreed to. Mr. Baillie and Mr. Oldrieve were elected Vice-Presidents; Mr. Colin B. Cownie, Hon. Secretary; Mr. W. G. Walker, C.A., Hon. Treasurer; and Mr. John Watson, Librarian. Mr. Tarbolton, in his address, said they looked forward to the time when the municipality would look to the Association for guidance in questions that affected the architectural development of the city. Matters dealing with the training of the architecture student had been very much influenced by recent events and possible forthcoming changes in art education in Edinburgh. The proposed new Municipal Art School would be concerned with the general principles of art education, but could not be expected to carry its students into the higher regions of the particular science of architecture. That such a school was likely to be instituted in Edinburgh was a matter for congratulation, and with it would be introduced, he hoped, a new era of activity. The foundation of this art school would be a task that would demand the most anxious attention on the part of the municipality, and he hoped no steps would be taken without consultation with acknowledged experts in architectural training. He maintained that the teaching throughout the school should be of a synthetic nature—i.e., that there should be common groundwork for all the teaching, so that free inter-communication could take place between the various branches of study. All students should be trained up to a certain point before particularising in any one branch. Painters, sculptors, decorators, designers, and architects should have a definite and common basis of art training, for he was convinced by so doing the student would be enabled to discover his real vocation. Painters would benefit by an architectural training, and architects would gain immeasurably by a knowledge of the theory and possibly practice of painting. At present men following the various art callings worked on almost parallel lines which seldom touched, and more overlapping would produce mutual benefits. With regard to the subjects which would be necessary for the course of art and science training of the architecture student, he could only quote from the recommendation of the Board of Education of the Royal Institute of British Architects, as follows:—I.—The nature and properties of building materials. II.—Construction, including (*a*) applied mechanics and mathematics in so far as they were necessary to the solution of problems of construction; (*b*) the practical methods of the building trades. III.—Architectural drawing, including (*a*) in the elementary course—geometrical, freehand, perspective, and graphic methods of working out problems, and such drawing as will train the student in the selection of form and in the study of mass and proportion; (*b*) in the more advanced course—drawing of a more advanced nature, and to include a course of study from the antique and life. (He should certainly like to add to this course the theory of colour, which he considered most important for all architects.) IV.—The study of architectural forms that have been evolved in the architecture of the past out of constructional necessities, and exercises in the design of construction to meet definite problems. V.—The study of the history of architecture in so far as it illustrates and explains the evolution of architecture through constructional material and social conditions. The new school for architectural training would not be complete without a workshop, where demonstrations could be given in actual materials. Modelling, too, should be taken as an item in the general art studies. Professor Baldwin Brown, in moving a vote of thanks to Mr. Tarbolton, said, with regard to the question of architectural education and the new art school that they hoped would be established before long, they would like to see architecture taught in the school according to a proper system, and that the whole decorative arts would be grouped together under architecture and looking to architecture as their head. He should like painting to remain, in their new system, entirely under the control of the Royal Scottish Academy, so as not to break the long and honourable tradition of the life school of the Academy. If that tradition were broken, they would do more harm than good to that branch of education. They would do best by building on the foundations they had.

Archæological Societies.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—A meeting was held on the 18th inst., Mr. C. H. Compton, Vice-President, in the chair. An exhibition of Samian ware and a flint arrow head discovered in Elmstead Wood, near Chislehurst, was made by Mr. Nichols. Mr. R. H. Forster, hon. treasurer, read a paper upon "The Tenth Iter of Antoninus and the Roman Stations in the North of England." He said the course of the tenth iter from Mediolanum through Manchester and Ribchester so far as Overborough has been generally agreed upon, but the positions of the remaining stations have been the subject of much speculation. Mr. Watkins ("Roman Lancashire") continues the route northwards, making Borrow Bridge, Alone; Kirby Thore, Galava; and Whitley Castle, Glanoventa, the terminus of the iter; but this is not satisfactory, as Whitley Castle is not a likely terminus, and a comparison of the distances given in Iter II. and Iter V. show that Kirby Thore was Brovonacæ—probably the same as the Braboniacum of the "Notitia." Old Carlisle, near Wigton, has been suggested, but it is hard to fit the intervening stations to known Roman sites. A more likely place is Ravenglass, which was an important post up to mediæval times; and if Ravenglass be Glanoventa, Ambleside will be Galava, Watercrook, near Kendal, Alio, and Overborough, Galacum, the respective distances corresponding with fair accuracy if the route from Overborough be taken due west till the road from Lancaster to Watercrook is joined. Assuming that Glanoventa, Alio, and Bremetonacum of the Itinerary are the Glannibanta, Alone, and Bremetenracum of the "Notitia," we get three of the stations *per lineam valli* in a definite order, and it is possible to connect this linea with the linea from Segedunum to Amboglanna, if we take into account the duties of the garrison of the north of England, which at the date of the "Notitia" had been largely reduced. The wall across South Northumberland was fully garrisoned, but North Cumberland seems to have been strongly held; in fact, rather policed than garrisoned. The prime necessity in the West was the protection of the Cumberland coast from raids by the Picts and Scots, and most of the intervening stations must be sought for here. Possibly Petriana

was Stanwix, beside Carlisle, and the Ala Petriana may also have garrisoned Old Carlisle. Aballaba is identified with Papcastle, and the four remaining stations probably lie on the coast, viz., Congavata at Mallray, Axelodunum at Maryport, Gabrosentis at Burrow Walls, near Workington, and Tunnocelum at Moresby, near Whitehaven, where a small natural harbour formerly existed. Olenacum and Virosidum remain, and these, if the linea is continued, should be south of Ribchester—possibly at Wilderspool, near Warrington, and Brough, near Buxton. This arrangement suggests that a large part of the reduced garrison of Britain was employed in watching the hill tribes of the central mountain chain, and that the troops included in the second section of the Notitia list guarded the eastern and northern valleys, especially as we get a linea of Lavatræ (Bowes), Verteræ (Brough), and Braboniacum (Kirby Thore). Præsidium may have been Brough, on the Humber, Danum has been identified with Doncaster, and Morbium may be placed at Templeborough. Placing Arbeia at Almondbury, Dictis at Ilkley, and Concangium at Bainbridge, near Askrigg, we come to the linea mentioned. Longovicum seems to be Lanchester, in Durham, and the intervening stations of Maglova and Magæ may possibly be found at Whitley Castle, near Alston, and Old Town, in Allendale. If the last station, Derventio, were Ebchester, the linea would end only fifteen miles from Segedunum, where the "item per lineam valli" section begins; but this would involve a change of name, and perhaps Derventio is an outlying station on the Yorkshire Derwent. The paper was accompanied by maps and other illustrations. An interesting discussion followed the paper, in which the Chairman, Mr. Emanuel Green, Mr. Edmonds, Mr. C. J. Williams, and others took part.

Engineering Societies.

THE INSTITUTION OF CIVIL ENGINEERS.—At the annual general meeting of the Institution of Civil Engineers held on Tuesday evening, Sir Alexander Binnie, President, in the chair, the result of the ballot for the election of officers was declared as follows:—President—Sir Alexander B. W. Kennedy, LL.D., F.R.S.; Vice-Presidents—Mr. W. R. Galbraith, Mr. William Matthews, C.M.G., Sir E. Leader Williams, and Mr. J. C. Inglis; other Members of Council—Lieut.-Colonel W. P. Anderson (Ottawa, Canada), Mr. B. Hall Blyth (Edinburgh), Mr. John Benton, C.I.E. (India), Mr. C. A. Brereton, Mr. R. Elliot-Cooper, Colonel R. E. B. Crompton, C.B., Mr. Joseph Davis (Sydney, N.S.W.), Dr. G. F. Deacon, Dr. Francis Elgar, F.R.S., Mr. M. Fitzmaurice, C.M.G., Mr. R. A. Hadfield (Sheffield), Mr. G. H. Hill, Mr. Walter Hunter, Mr. J. H. Johns (Johannesburg), Mr. G. R. Jebb (Birmingham), Sir William T. Lewis, Bart. (Aberdare), Sir George Livesey, Mr. A. G. Lyster (Liverpool), Sir Andrew Noble, Bart., K.C.B. (Newcastle-on-Tyne), the hon. C. A. Parsons, C.B., F.R.S. (Wylam-on-Tyne), Mr. A. Ross, Mr. A. Siemens, Mr. J. Strain (Glasgow), Sir John I. Thorneycroft, LL.D., F.R.S., Prof. W. C. Unwin, B.Sc., F.R.S., Mr. A. F. Yarrow. The Council of the Institution have made the following awards for papers read and discussed before the Institution during the past session:—A Telford gold medal to Mr. J. A. Saner, a Watt gold medal to Mr. G. G. Stoney, and a George Stephenson gold medal to Dr. T. E. Stanton; Telford premiums to Mr. Leonard Bairstow, Mr. H. S. Bidwell, Mr. J. J. Webster, Mr. Cathcart W. Methven, Mr. H. A. Mavor, Sir Frederick R. Upcott, K.C.V.O., C.S.I., and a Manby premium to Mr. D. E. Lloyd-Davies. The presentation of these awards, together with those for papers which have not been subject to discussion and will be announced later, will take place at the inaugural meeting of next session.

Books.

Ecclesia Antiqua. By the Rev. JOHN FERGUSON. (London and Edinburgh: Oliver & Boyd. 1905.)

UNDER this title the author, who is the minister of Linlithgow, has written a very full and exhaustive account of his fine parish church. From the nature of much of its contents the interest of this work will probably be, as the author suggests, largely local, but the building itself is so well known outside its immediate neighbourhood as one of the finest parochial churches of Scotland that this painstaking effort to record all that is most interesting from its foundation to the present will appeal to a wider circle of readers.

The church has undergone two restorations, and the result of each is shown by photographic illustrations. Of the first, in 1812, the less said the better. The second, commenced in 1904, has restored the church to something of its ancient beauty by the clearing away of the galleries and other disfigurements of the early part of the century and the opening of the church for its whole length. The depressed vaulted ceiling has still to be dealt with, and stalls provided in the choir.

In addition to a description of the church itself, a chapter is devoted to the ancient chapels connected with it; a list of the vicars is given from 1264, and in an appendix are given the dedications and details, as far as recorded, of the numerous altars that were formerly in the church.

Good photographs are given of the exterior and interior, and a ground plan. The latter, however, has no scale.

Hygiene. By J. LANE NOTTER, M.A., M.D., etc., and R. H. FIRTH, Lieut.-Col. R.A.M.C., etc. Sixth Edition. London: Longmans, Green, & Co. 1905.

THE authors of this well-known text-book state in the preface to the new edition that "the present issue has been completely revised, in many places completely rewritten, and much new matter added." It contains eleven chapters, dealing with air, water, food, sites, and buildings, refuse disposal, personal hygiene, infection and disinfection, parasites, climate and weather, vital statistics, and sanitary law. Much of the matter is above criticism, but the architect will find in the chapter on sites and buildings the need of further revision. Fig. 34 is a case in point; the brick footings are badly bonded, the damp-courses are not continued under the wood sleepers, and water soaking from the ground into the outer lining of the hollow wall would spread over the damp-course at the bottom of the cavity and rise upwards in the inner lining. The wash-out water-closet is not one of the "best kinds," and the wash-down closet, illustrated in Fig. 43, is not "one of the best" of its class, but is defective in the shape of the basin and the position of the outlet joint. Zinc as a material for wastepipes and soil-pipes ought not to be mentioned, except for condemnation. The authors are more at home in the other chapters, which will be of great value to sanitary inspectors and others.

Sanitary Engineering: A Practical Manual of Town Drainage and Sewage and Refuse Disposal. By FRANCIS WOOD, M.Inst.C.E., F.G.S. Second Edition. London: Charles Griffin & Co. 1906.

FOUR years ago we reviewed the first edition of this book, and drew attention to a number of errors and misprints. We are glad to find that these have now been corrected, but it is a pity that the author has not taken the trouble to revise the whole work carefully, as we did not, in our short review, mention all the errors and loose statements which were to be found in the book. The latter part of the paragraph on pp. 175 and 176 still contains two or three serious mistakes: If the daily discharge of sewage per head is 18 gals., "an average house" which "contains five persons" will not produce "about 180 gals. per day," and if we accept the author's data as to the proportion of albuminoid ammonia, the quantity of water to be added in order to render the sewage "pure enough to be allowed to discharge into a river without treatment" will not be "67,500 gals.," nor anything like it; and what, we may ask, is to be gained by making the sewers of sufficient capacity to allow the sewage to be diluted with the surface-water produced by a daily rainfall of 8·5 in.?—a rainfall of more than 3,000 in. per annum! In the second paragraph of page 176 we pointed out an error in calculation, and our correction (48·6 instead of 37·5) has been adopted in the new edition, but the author has not troubled to revise the next paragraph, where 37·5 still stands in company with other errors. The author's logic is more quaint than cogent; on page 177 we find (in both editions):—"The separate system [of drainage or sewerage] would be carried out in a town with good gradients; it is policy to do so, and if this is the case, which we may admit for the moment, then it is also policy to do so in all other cases." It is a pity that such blemishes as these should have been allowed to remain in a book which has many good qualities and contains much useful information. Two pages have been added to describe the method of refuse disposal adopted at Fulham, and a few small alterations have been made in the text, but, in the main, the new edition is a revised copy of the first.

Mechanics of Air Machinery. By Dr. WEISBACH and Professor HERRMANN. Translation by Professor A. TROWBRIDGE. (London: Crosby Lockwood & Son. New York: D. van Nostrand Co. 1905.)

ENGINEERS in the United States are far more familiar than their English *confrères* with Weisbach's work on "Engineering Mechanics"—a treatise which was revised by Professor Herrmann and has been translated in separate volumes for American engineers. The book now issued is the final portion of Weisbach's work published in the English language. It is not a complete treatise upon air machinery, being devoted mainly to the consideration of fans, blowers, and auxiliary apparatus, which constitute but a very small proportion of the appliances coming under the category of pneumatic machinery in the present day. The intending purchaser should look closely into the character of the book before deciding whether or not it will fulfil his requirements. The theory of air movements and air-moving appliances is sound and admirably worked out, although some of the illustrative matter and data are now obsolete. The translator has evidently recognised the inadequacy of this chapter from Weisbach as a treatise on modern air machinery, for he has added an appendix, wherein descriptions are given of some modern air-moving machines, such as blowing-engines, blast furnace gas blowing-engines, air compressors, and high-pressure fans. As these are of American types and are only described in general terms, the appendix does not add very materially to the value of Weisbach's theoretical discussion of the subject. When an engineering treatise has arrived at the respectable age attained by Weisbach's classical work, mere translation into another language can scarcely be expected to effect the rejuvenation that is demanded by the requirements of a new generation.

Tables for the Conversion of Canal Boat Gaugings to Standard Tons. Compiled by S. L. THACKER. M.Inst.M.E. London: *Iron and Coal Trades' Review.* 1906.

THIS table serves as a further illustration of the general method of calculation recommended in Article XIII. of our present Student's Column. Recognising the disadvantages of the irregular and unsystematic methods hitherto adopted for computing the actual weights carried in canal barges, Mr. Thacker has calculated constants by which, with careful gauging, the standard weight can be ascertained by a simple multiplication within 5 cwt. The following example given by the author shows the labour-saving nature of his table of constants:—

"Boat 71 ft. × 7 ft. 1 in. Net gauge 26½ in.
Then under 7 ft. 1 in. and opposite 71 ft., find 1·087.
Then:—26·5 × 1·087 = 28·8, say, 28 tons 15 cwt."

We may remark that, in the original, 26·5 is printed as 2·65, a little slip which the author and the publishers have doubtless noticed by this time. Those of our readers who make use of barges for the conveyance of materials should find the table of practical utility.

Gas and Oil Engine Management: A Practical Guide for Users and Attendants. By M. POWIS BALE, M.Inst.C.E., M.I.Mech.E. Second Edition. London: Crosby Lockwood & Son. 1906.

VERY little improvement could be made in the contents of the original edition of this

excellent companion for the user of internal combustion engines. But, as during the last year or two the adoption of gas-producers has been widely extended, the author has done well to add a chapter describing and illustrating some of the various producers in the market, and giving simple directions for their management. The subject-matter of this chapter is confined to appliances of small and medium sizes, such as are suitable for ordinary industrial establishments and public institutions, and by its addition the value of the handbook is materially increased.

Brass and Iron Founding. By JOSEPH E. DANGERFIELD. London: Dawbarn & Ward.

THIS pamphlet is No. 8 of "The Home Worker's" series of practical handbooks, and is virtually a complement to "Pattern Making" by the same author. The method of moulding various simple patterns is described in detail, and the patterns selected as examples serve in each case to illustrate some special artifice employed by moulders. The directions here given will no doubt be of service to the amateur and to others who merely require elementary knowledge on the subject of moulding.

The Water Supply of Villages and Small Towns. By H. C. H. SHENTON, M.S.E. London: S. Edgecumbe Rogers. (No date.)

This pamphlet of fifty-six pages, eighteen of which are occupied by advertisements, index, and title, contains a reprint of articles contributed by the author to the *Local Government Journal*. According to the sub-title, the matter consists of "practical notes in a handy and portable form," and the description is accurate, but the addition of suitable illustrations would have added to the value. On page 35 there is an error in the calculations:—1000 25 does not equal 200.

The Country Gentlemen's Estate Book, 1906. Edited and Compiled by WILLIAM BROOMHALL. London: The Country Gentlemen's Association, 24, St. James's-street. 1906.

THIS book shows no falling off in the variety and usefulness of its contents, most of which have appeared in previous numbers, whilst some are new, such as the paper on "The Protection of Agricultural Buildings from Lightning." Surveyors, architects, and builders who are concerned with country matters will find this book now, as heretofore, almost a necessity. Apart from its utilitarian purposes, it is often interesting reading.

BOOKS RECEIVED.

ENCYCLOPÆDIA OF PRACTICAL ENGINEERING AND ALLIED TRADES. Edited by Joseph Horner, A.M.I.Mech.E., Vol. III. (Virtue and Co. 7s. 6d.)

ELIAS DE DERHAM, RECTOR OF HARROW (Harrow Octocentenary Tracts, No. XII.). By the Rev. W. Done Bushell. (Cambridge: Macmillan & Bowes. 1s.)

PLASTERERS' WORK (Mechanics' Manuals). Edited by Paul N. Hasluck. (Cassell & Co. 6d.)

GLASS WRITING, EMBOSSING, AND FACIA WORK. Edited by Paul N. Hasluck. (Cassell & Co. 1s.)

FIRE TESTS WITH DOORS. British Fire Prevention Committee's Report, No. III. (Published by the Committee. 3s. 6d.)

THE ART OF GARDEN DESIGN IN ITALY. By H. Inigo Triggs, A.R.I.B.A. (Longmans, Green, & Co. 3*l.* 13s. 6d.)

Correspondence.

THE SAN FRANCISCO FIRE.

SIR,—The Press during the past week has been full of the earthquake and subsequent fire which has laid the greater part of San Francisco in ruins. In one of the accounts published by the London Press, it is stated that the only building which effectually withstood the fire was the "Mint."*

It may interest your readers to know that the Mint was built of an extremely hard sandstone, of a light grey colour, with black specks. The stone was quarried on the east coast of Vancouver Island, North of Nanaimo—no suitable stone being nearer.

In 1889 I explored portions of the coast of British Columbia for sandstone for building purposes, and visited this disused quarry, finding the stone as above described; the appearance somewhat resembled grey granite, but on close examination it proved to be sandstone of the carboniferous series of Nanaimo. Local masons with whom I consulted also agreed that it was a sandstone, but said they had heard rumours that it had not weathered well, so when I visited San Francisco a few months afterwards I purposely went to the "Mint" and saw the clerk of the works in charge, who informed me the stone had weathered well and had given great satisfaction.

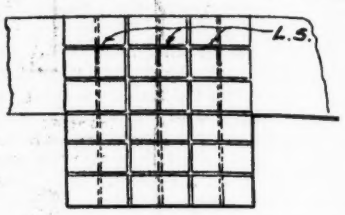
It should be understood that the "Mint" is a very substantial building (one built to last) and not of the usual American type.

JOHN J. ROBSON, M.Inst.C.E.

*** Was this a steel-framed building, or one depending on ordinary masonry? That is an important point.—ED.

REINFORCED BRICK PIERS.

SIR,—In your report in the *Builder* of 21st inst. of the discussion of Mr. S. Bylander's paper on "Reinforced Concrete" at the joint meeting of the Architectural Association and the Junior Institution of Engineers, I am credited with suggesting Hennebique reinforcement for brick piers. This is hardly the impression I intended to convey. My suggestion was to build in vertical reinforcement at the points where the ½ in. vertical joints of the brickwork intersect on plan, in order to reduce the cutting of the bricks to a minimum. A cheap and simple method of tensional reinforcement would be obviously an advantage of the greatest importance in all brick piers subject to a bending moment, as in all tall piers and all piers loaded on one side only, and it does not seem to be impracticable. For instance, a 2 ft. 3 in. brick pier in cement would be reinforced in tension up to its full strength in compression by building in vertically small angle sections which only entail the use of two half bricks in place of whole bricks at three places in each course. This would neither materially affect the bonding nor the cost. (See sketch.)



I have since heard that experimental piers built dry and reinforced with rods at the intersections of the joints have been built and tested with a marked increase of strength; but ¼ in. rods (the largest that could be built in without cutting the bricks) would be insufficient to develop sufficient strength in tension, and would not enable a tall or eccentrically loaded pier or a retaining wall counterfort to be loaded up its full strength in compression.

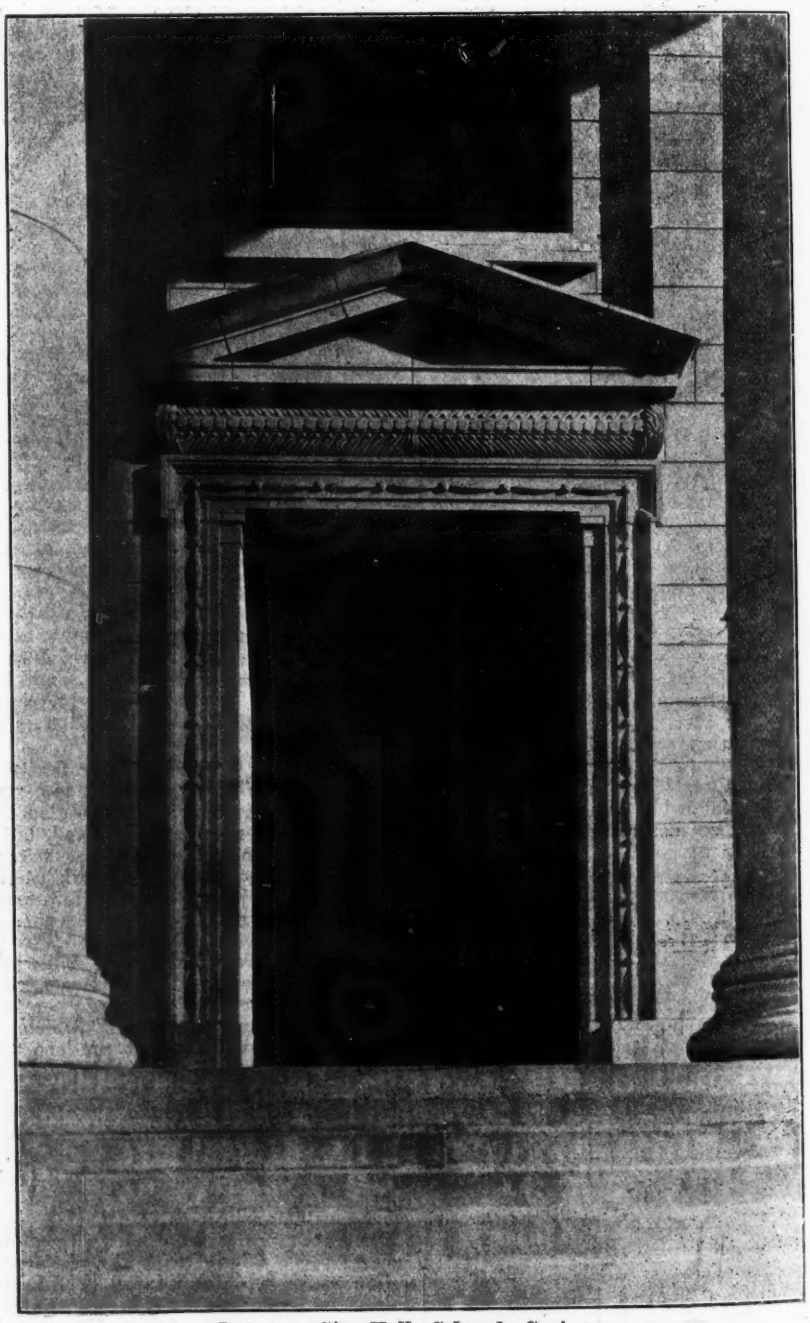
PERCY J. WALDRAM.

Illustrations.

THE CITY HALL, COLORADO SPRINGS, COLORADO.

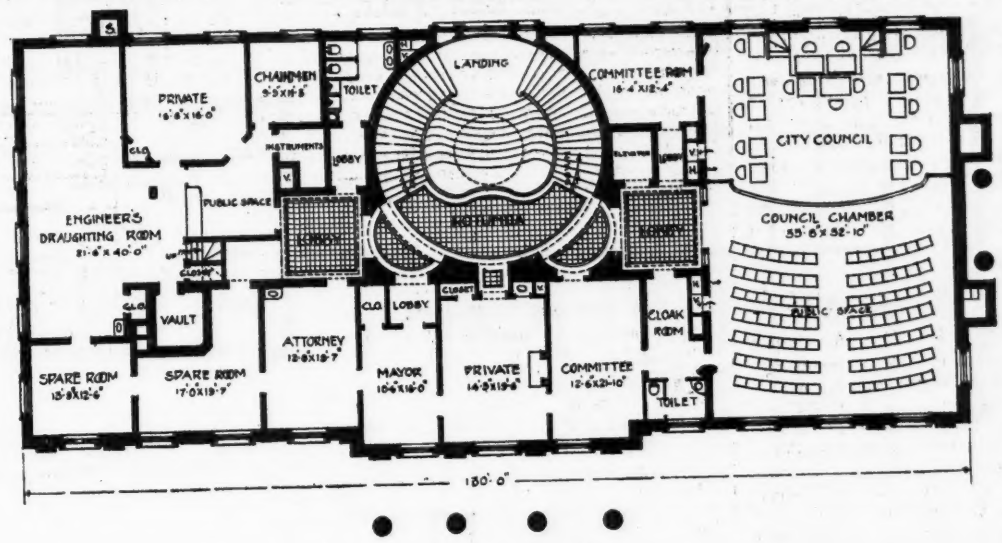
THIS building is constructed of Colorado barre granite, the texture and colour being similar to that of barre vermont.

The basement and floor over are of fireproof construction, the concrete in the floors

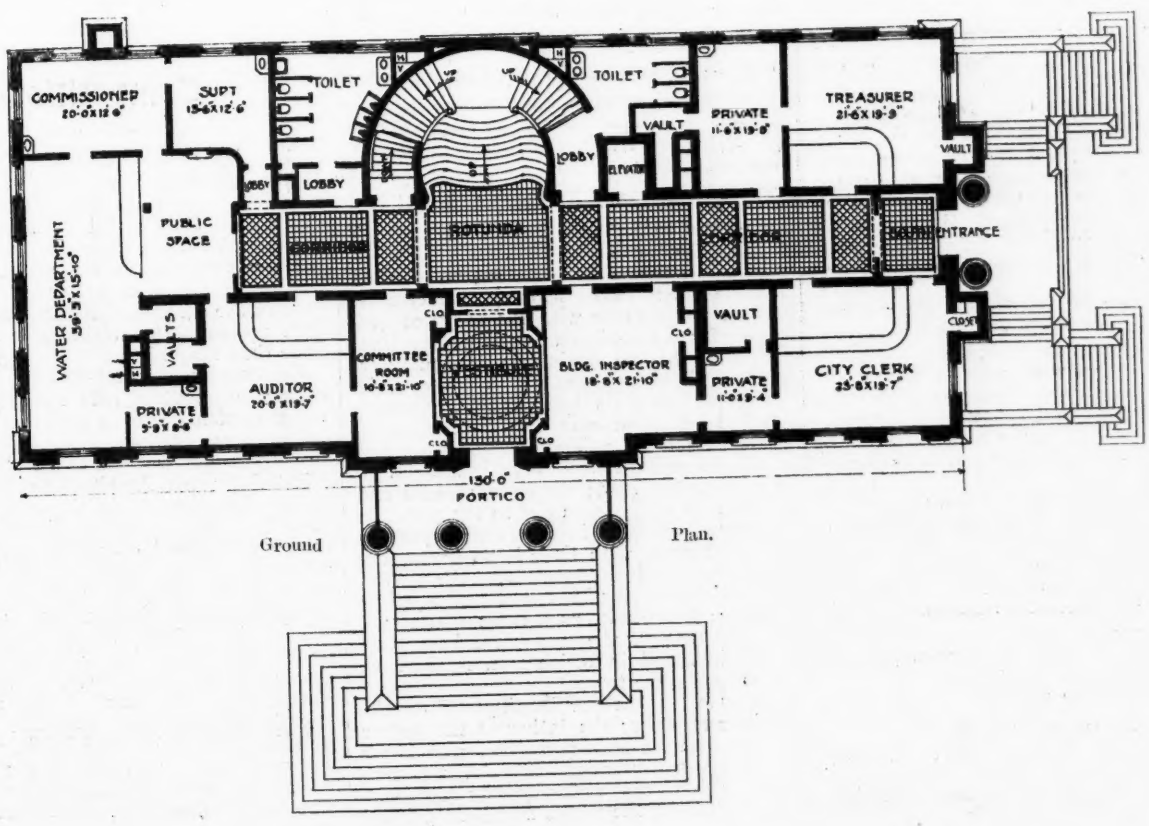


Doorway, City Hall, Colorado Springs.

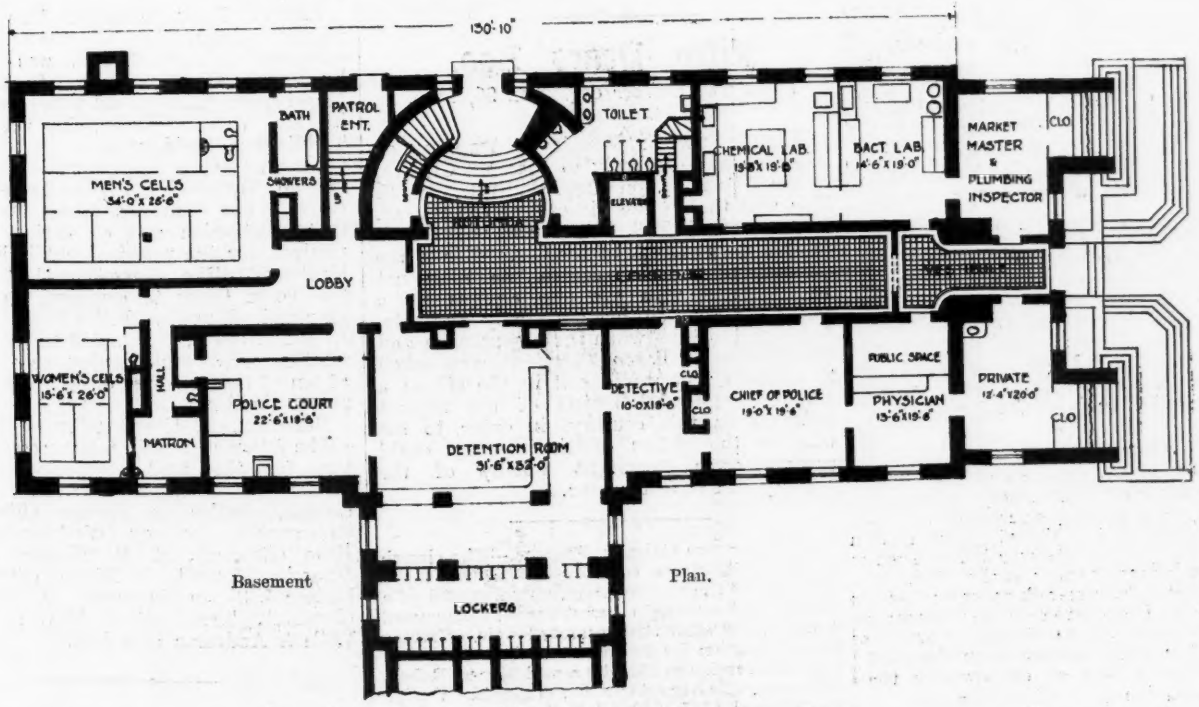
* This was evidently a mistake.—Ed.



Upper Plan.

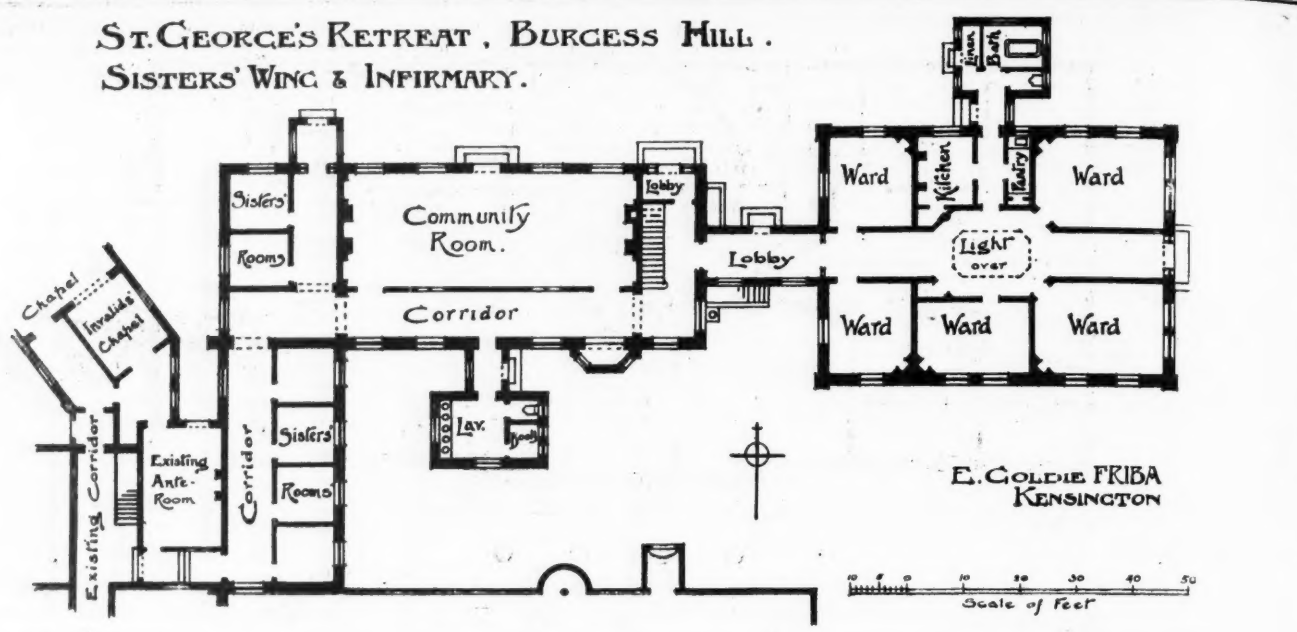


Ground Plan.



Basement Plan.

City Hall, Colorado Springs, Colorado. Plans.



being reinforced on the Roebling method. Wood partitions in upper stories are covered with expanded metal lath, and cement plaster is used throughout.

The building is heated by steam on the Paul system, and with Johnson's thermostat temperature regulators attached. The steam is supplied from the city plant, thus obviating a boiler-room in the building. For the ventilation of the larger rooms the Dickson system is used.

The plans herewith illustrated show the accommodations provided on the various floors. The staircase is roofed over by a simple coffered dome and with a stained-glass light in the centre. The woodwork on the principal floors is of flat-sawn oak, and the council-chamber walls are wainscotted to a height of 13 ft. The woodwork is stained a neutral green.

The plans and specifications were prepared by Mr. T. MacLaren, architect, Colorado Springs (formerly of London), while the building was superintended by Mr. T. P. Barber, architect, and Mr. C. E. Thomas. The contractor was Mr. L. S. Atkinson.

SISTERS' WING AND INFIRMARY, ST. GEORGE'S RETREAT, BURGESS HILL.

A NEW wing has recently been added to St. George's Retreat, Burgess Hill, Sussex, affording accommodation for the sisters and an infirmary for the patients, which latter is provided with nine beds. It is mainly of brick and faced with local grey stocks, with red rubber arches, and is covered with green Whitland Abbey slates. The community-room is panelled with Kauri pine. All floors are of fireproof construction, and mainly laid in "Eubœolith" and wood-block paving. "Fram" partitions are used to divide the bedrooms. The infirmary being of one story only, the roofing has been so constructed as to form a promenade for the patients.

The whole building is heated with a low-pressure hot-water system, and is lighted by electricity supplied from its own station in the grounds.

The work has been carried out by Messrs. Parnell & Son, of Rugby, under the superintendence of Mr. Edward Goldie, architect, of Kensington, Mr. E. Wingfield-Bowles having acted as consulting engineer for the electric-light work.

DESIGN FOR AN OPEN-AIR SWIMMING-BATH.

THIS design, by Mr. Adrian Berrington, of Prenton, Birkenhead, was submitted for the Tite Prize of the Institute of Architects this year, for which it could have had no chance, as it is not in the Italian style, which is always a condition in the competition for the Tite Prize, the prize having been founded with the special object of encouraging the study of the Italian style of architecture.

This, however, was only a misunderstanding, or an error of judgment, and as the design has in itself some fine qualities, and shows very great promise as the work of a young student, we have wished to give him whatever encouragement he might derive from its publication in our pages.

The design was made when the author was a student of the age of eighteen in the Liverpool University School of Architecture.

In regard to his intentions in the design Mr. Berrington writes:—

"In my design I have striven to combine the monumental and mystic character of Egyptian architecture with the unity of conception of the Classic on broad Classic lines rather than on the distinctive Italian interpretation. I thought of it as being built in a town, hence its inaccessibility through all but the ordered entrances, and intended the large halls as a setting for splendour and the pseudo-underground apartments as a refuge from the heat; the open stadion and the spread of steps as an aid to the pageants with which I filled it in my mind's eye; the small courtyards, with their little colonnades as a foil to the plane expanses of the pylons, whose angles are carried to the ground and into the water; the whole, as a large white cup, where the rays of the sun might beat from side to side, and in which men might bask in seclusion in the town."

The name "J. Arthur Berrington" on the plates is a mistake; the father of the author wrote to us with that signature, and hence there arose a confusion between the two names, which was unfortunately not discovered till after the plates had been printed off.

Fifty Years Ago.

FROM THE *Builder* OF APRIL 26, 1856.

MONUMENT AT ST. PAUL'S TO THE DUKE OF WELLINGTON.—In reply to Viscount Chelsea, in the Commons, on the 18th inst., Sir B. Hall said that if the disposal of the 25,000*l.* balance of 80,000*l.* voted for the Duke's funeral were placed, by the Chancellor of the Exchequer, under his control, he would not rest satisfied with the two designs for a monument sent in by Mr. Baily and Mr. Foley at the time when these gentlemen and Mr. Gibson and Baron Marochetti were asked to compete, but would call in the aid of a greater number of artists of the highest eminence in this country, in order to see whether the genius of the country could produce some monument worthy of the memory of so great a man.

ALL HALLOWS CHURCH, EXETER.—The church in Goldsmith-street is being demolished for a widening of the thoroughfare. It consisted of a chancel and nave with a west turret, constructed of stone, and after the Decorated style, affording accommodation for 200 persons. It was rescued from destruction in 1658 by a parishioner, Robert Vilwayne, who bought the church for 50*l.* During the interval 1767-1822 All Hallows was used for vestry purposes only; the fabric was restored in 1883-4, and three years subsequently the west wall was rebuilt.

Competitions.

ST. PANCRAS CENTRAL LIBRARY.—The Public Libraries Committee of St. Pancras reported on Monday having decided that the designs for the Central Library must be sent in not later than June 15. A copy of the requirements and conditions, together with a plan of the site, has been forwarded to each of the six competing architects, who have been requested to submit any questions not later than May 15.

CHURCH AND SUNDAY-SCHOOL, WOLSTANTON.—In a competition held recently for a new Congregational church and Sunday-school at Wolstanton, Stoke-on-Trent, the design sent in under *nom de plume* of "Ready" was selected by the Architect to the Congregational Union, to whom the designs were submitted for adjudication. The author of this design proved to be Mr. Reginald T. Longden, of Burslem. The scheme includes a church to seat between 500 and 600, and with vestries, organ-chamber, etc., and Sunday-schools in distinct apartments for kindergarten, primary, junior, intermediate, and senior scholars respectively, with twelve class-rooms, superintendent's room, and library, church parlour, and kitchens, etc. The building will be of local brick, with cherry-coloured, sand-faced, stock facings, with wide joints and stone dressings, panels of rough-cast being introduced. The roof will be of red tiling.

BANGOR FREE LIBRARY.—The first premiated design in this competition, as announced in our last issue, was that sent in by Messrs. Dixon & Potter, 65, King-street, Manchester. The second premiated design is by Mr. Vernon Hodge, 13, Grand-parade, Teddington, Middlesex.

LIBRARY, OLD KENT-ROAD.—At the meeting on Wednesday of Southwark Borough Council the Libraries Committee reported that ninety-nine sets of designs had been received for the proposed public library, old Kent-road. The Committee had instructed the Town Clerk to communicate with Mr. Rowland Plumbe, F.R.I.B.A., and Mr. A. W. S. Cross, M.A., F.R.I.B.A., inquiring whether they would undertake the selection of ten of the principal designs submitted and report thereon.

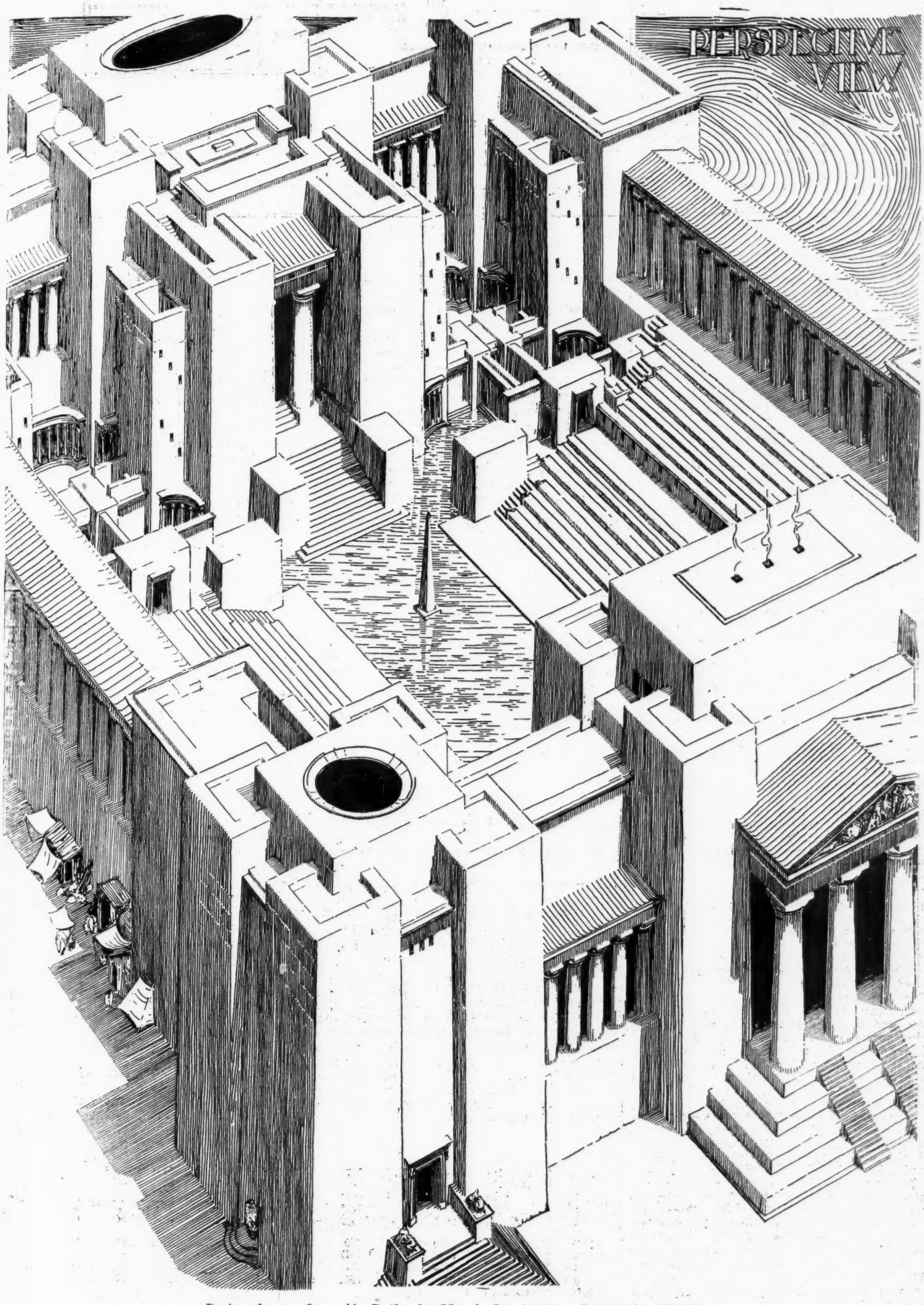
BIRMINGHAM, COUNCIL-HOUSE EXTENSION.—The following are the ten successful competitors for the final competition:—Messrs. Ashley & Winton Newman (London), Crouch, Butler & Savage (Birmingham), Greenway & Newbery (Westminster), H. T. Hare (London), E. P. Howard (London), Mansell, Mansell, & Dixon (Birmingham), Matear & Simon (Liverpool), A. N. Prentice (London), Treadwell & Martin (London), Wills & Anderson (London).

NEW CHURCH, ASH VALE.—The foundation-stone is to be laid shortly of a new church at Ash Vale. The plans for the work have been prepared by Mr. Steadman, architect.

NORWEGIAN TIMBER, GRANITE, AND BRICKS.

MR. F. GRAY, acting British Consul at Christiania, reporting on the trade of Norway for 1905, mentions that the amount of timber shipped from Norway during the last two years has been a trifle below the average, which is roughly 1,000,000 tons. The principal timber exporting town of Norway is Fredrikstad, which exports planed timber chiefly. The Vice-Consul at that port states as follows:—The past year was not a remunerative one for Fredrikstad flooring exporters, and probably most of them have closed their books with a loss. The reason of this is chiefly owing to the unreasonably high prices that they have for some time past had to pay for their logs and sawn wood, which again was caused by the lively demand and strong competition throughout the year from the pulp mills and cellulose factories. The total export of timber here as compared with two previous years has been as follows:—

	Quantity.		
	1903.	1904.	1905.
	Cubic mètres.	Cubic mètres.	Cubic mètres.
Flooring boards	355,517	308,357	290,707
Sawn wood	134,743	114,792	143,401
Hewn timber ..	4,736	2,971	2,144
Round timber ..	59,334	42,836	41,306
Staves	23,757	24,791	26,052
Firewood	55,083	50,271	48,334
Total	633,170	544,018	551,944



Design for an Open-Air Bath; by Mr. A. Berrington. Perspective Sketch.

The exportation of flooring boards from this district to the different countries abroad was 290,707 cubic mètres, of which 185,556 went to the United Kingdom. Prices for flooring boards opened low, viz., about 10*l.* per nominal standard for the usual dimensions, 1 in. by 7 in., first quality, red, and 8*l.* for mixed white, c.i.f., to cheap ports on the British west coast. During the summer and autumn months values, however, slowly but gradually increased, so that by the late autumn contracts for spring shipments, 1906, were being made at 11*l.* and 9*l.* respectively. As the prices for the raw materials, however, rose during the year, shippers have not benefited from the rise to the extent that might have been expected. It is very evident that the ever increasing competition for the purchasing of logs, both between the planing mills themselves and between the mills and the pulp wood factories, has driven the values of raw materials up to an abnormal height, and until these prices again come down to a reasonable level the flooring exporters will not be able to make any material profit. The quantity of flooring boards exported to the Cape and Australia was about the same as in 1904. At the commencement of the year sales were being effected at 8*l.* per standard, f.o.b., for 1 in. by 6¼ in. red wood flooring, and 7*l.* for the same dimensions in white wood. These values also benefited by the rise during the summer and autumn, and at the close of the season several sales were made at 9*l.* for red and 8*l.* for white. The demand from the Cape market was, however, small and restricted, the reason of this being that the heavy stocks that were imported during 1903 have not yet been worked off.

The Vice-Consul at Drammer gives the total exportation of sawn and planed timber from that town in 1905 as 50,321 register tons, of which about 30,000 tons went to the United Kingdom and some 7,000 tons each to Germany and the Netherlands. He adds: The market has been a flat and difficult one throughout the year. Owing to the ever-growing demand for logs, brought about through the increasing consumption by the pulp makers, the shippers have, to meet the competition, been compelled to raise their prices for logs to such an extent as has made it impossible for them to gain a profit on the prices obtained for their export during the year. The prices obtained for flooring, c.i.f. British ports, ranged during the year from 8*l.* to 8*l.* 10s. for white and from 10*l.* to 10*l.* 5s. for red. For Colonial shipments, from 7*l.* to 7*l.* 5s. for white and from 8*l.* to 8*l.* 5s. for red, f.o.b., was obtained. Of sawn deals and battens very little was exported from this port, and the prices obtained were far from good. During the last months of the year, increased prices have been obtained for floorings to be shipped per f.o.w., 1906, and as the season closes everything points to a speedy improvement.

Vice-Consul Franklin, of Porsgrund, states, with regard to the timber trade of his district in 1905, that "this branch of business was unsatisfactory to the exporters during the first nine months of the year, owing to the heavy cost of raw material and the comparatively low sale prices. The demand, however, as well as prices, improved during the last three months of the year, but as the goods sold were mostly for winter and spring shipment, 1906, the benefit has not yet really been encashed. The cost of raw material has again risen, especially for white-wood, owing to the strong demand on the part of the pulp mills. Great exertions are now being made on the part of private and public bodies with regard to the preservation and replanting of forests. Saw mills, etc., have not been worked to the same extent as in the previous year, the pulp mills having secured a larger portion than usual of the white wood logs. Last June a disastrous fire totally destroyed the largest saw mill concern and creosote works in Porsgrund, in which British capital was also partly invested. These works are not being re-erected, so the property in question is for sale.

The Vice-Consul at Fredrikshald, in his annual report, remarks that "the season opened at low prices, and only a moderate business was done during spring and summer. About September a firmer tone set in, and the year finished with a sharp rise in prices, with good prospects for 1906. The export was 4,459,221 cubic feet in 1905 and 4,890,160 cubic feet in 1904. The granite export trade of Norway fell off by 16,000 tons in 1905, the value declining by 16,000*l.* The chief ports for the trade are those of Fredrikstad and Fredrikshald, the former exporting some 100,000 tons and the latter some 50,000 tons per annum. Wooden house building is now no longer allowed in Porsgrund within a certain radius of the centre, so the consumption of bricks is on the increase. The largest brickworks (Borgestad) in that district were destroyed by fire last autumn, but are being rebuilt. Vice-Consul Thüs, of Fredrikstad, says that the price in his district "averaged last year about 11 kr. per 1,000 bricks, f.o.b., and the total production was between 30,000,000 and 35,000,000 bricks."

Trade Catalogues.

WE have received from the Tudor Accumulator Company, of Victoria-street, S.W., a catalogue of their well-known accumulators for use in connexion with electric lighting and for sub-stations in electric-traction systems. We notice that they guarantee for two years all stationary batteries which are erected in the United Kingdom under their supervision. They are also prepared to undertake maintenance contracts for ten years at rates varying with the situation of the battery and with its value. They guarantee during the whole of this time to maintain the battery at its rated capacity. Full particulars are given in the catalogue of all necessary accessories and various useful hints on the setting up and management of accumulators. Everyone contemplating the purchase of large secondary cells would do well to write for this catalogue.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—XVI.

DECIMAL LOGARITHMS: TABLES AND THEIR APPLICATION.

NUMEROUS tables are published in which values of common logarithms are given to different numbers of decimal places. For some calculations in physics and chemistry it may be necessary to employ *ten-figure* tables, but for most other purposes a *seven-figure* table satisfies all requirements, while many calculations can be performed with sufficient accuracy by the aid of *six-figure*, *five-figure*, and even of *four-figure* tables.

As the final figures in a large number are of comparative unimportance, and especially when these form part of a decimal fraction, ordinary calculations such as come within the daily practice of the architect do not usually demand logarithms that have been carried to more than four places of decimals.

Nevertheless, the selection of a logarithmic table should always be made with due regard to the degree of accuracy required, and for general guidance in this respect it may be taken that the number of figures in the logarithms employed should not be less than the number of significant figures in the factors of any given calculation.

Tables of common logarithms contain only mantissæ which are generally but not quite correctly termed the logarithms of numbers. In some places we have adopted the same terminology.

Tables XI. and XIA. contain extracts from a *seven-figure* table of logarithms by which the mantissa of the logarithm of any number from 1 to 108,000 can be read directly, and the number corresponding to any logarithm can be obtained without much trouble.

To Find the Logarithm for any Given Number.

In Table XI. every number and the mantissa of its corresponding logarithm are printed in full, although, as usual, the characteristic and decimal point are omitted to save space and to render the mantissæ suitable for all numbers having significant figures within the limits of the table.

Thus, inserting the characteristic as explained in Article XIV.:—

log. 796 (reading 9009131) = 2·9009131
log. 79·6 (reading 9009131) = 1·9009131
log. 7·96 (reading 9009131) = 0·9009131

In Table XIA. the first four figures of the natural numbers are printed in the column headed "No.," and the fifth figure of the same numbers at the top of the succeeding columns. At the end of the table the first five figures of the natural numbers are printed in the column headed "No.," and the sixth figure of the same numbers at the top of the succeeding columns.

The characteristic and decimal point are omitted, and, with the object of further economising space, the first three figures of the mantissa for every number are printed only in column (0), and even there only at

TABLE XI.—SEVEN-FIGURE LOGARITHMS OF NUMBERS FROM 1 TO 999.

No.	Log.	No.	Log.	No.	Log.	No.	Log.	No.	Log.
1	0000000	51	7075702	101	0043214	151	1789769	201	3031961
2	3010300	52	7160033	102	0086002	152	1818436	202	3053514
3	4771313	53	7242759	103	0128372	153	1846914	203	3074960
4	6020600	54	7323938	104	0170333	154	1875207	204	3096302
5	6989700	55	7403627	105	0211893	155	1903317	205	3117539
6	7781513	56	7481880	106	0253059	156	1931246	206	3138672
7	8450980	57	7558749	107	0293838	157	1958997	207	3159703
8	9030900	58	7634280	108	0334238	158	1986571	208	3180633
9	9542425	59	7708520	109	0374265	159	2013971	209	3201463
10	0000000	60	7781513	110	0413927	160	2041200	210	3222193
796	9009131	846	9273704	896	9523080	946	9758911	996	9982593
797	9014583	847	9278834	897	9527924	947	9763500	997	9986952
798	9020029	848	9283959	898	9532763	948	9768083	998	9991305
799	9025468	849	9289077	899	9537597	949	9772662	999	9995655
800	9030900	850	9294189	900	9542425	950	9777236		

TABLE XIA.—SEVEN-FIGURE LOGARITHMS OF NUMBERS FROM 1,000 TO 108,000.

No.	0	1	2	3	4	5	6	7	8	9	Diff.
1000	0000000	0434	0869	1303	1737	2171	2605	3039	3473	3907	
01	4341	4775	5208	5642	6076	6510	6943	7377	7810	8244	433
02	8677	9111	9544	9977	0411	0844	1277	1710	2143	2576	1 43
03	0013009	3442	3875	4308	4741	5174	5607	6039	6472	6905	2 87
04	7337	7770	8202	8635	9067	9499	9932	0364	0796	1228	3 130 4 173
05	0021661	2093	2525	2957	3389	3821	4253	4685	5116	5548	5 217 6 260
1006	5980	6411	6843	7275	7706	8138	8569	9001	9432	9863	7 303 8 346
07	0030295	0726	1157	1588	2019	2451	2882	3313	3744	4174	9 389
08	4605	5036	5467	5898	6328	6759	7190	7620	8051	8481	
09	8912	9342	9772	0203	0633	1063	1493	1924	2354	2784	
10	004·214	3644	4074	4504	4933	5363	5793	6223	6652	7082	
10791	03306169	6572	6974	7377	7779	8182	8584	8986	9389	9791	
92	03310194	0596	0999	1401	1803	2206	2608	3011	3413	3815	
93	4218	4620	5022	5425	5827	6230	6632	7034	7437	7839	402
94	8241	8644	9046	9448	9851	0253	0655	1058	1460	1862	1 40
95	03322265	2667	3069	3472	3874	4276	4678	5081	5483	5885	2 80 3 121
10796	6288	6690	7092	7494	7897	8299	8701	9103	9506	9908	4 161 5 201
97	03330310	0712	1115	1517	1919	2321	2723	3126	3528	3930	6 241 7 281
98	4332	4735	5137	5539	5941	6343	6745	7148	7550	7952	8 322 9 362
99	8354	8756	9158	9561	9963	0365	0767	1169	1571	1973	
10800	03342376										

intervals. In most cases where the three first figures are not printed they must be taken from the line above, the characteristic and decimal point being added as before. The exception to this rule is explained later.

Rule (1).—To find the logarithm for a number containing four figures, take the mantissa from the column headed (0) on the same line as the number, and add the proper characteristic.

Example (1):

log. 1008 (reading 0034605) = 3·0034605
log. 100·8 (reading 0034605) = 2·0034605
log. 10·08 (reading 0034605) = 1·0034605

The logarithms for numbers containing five figures, from 10,000 to 10,800, can be found in the same way.

Rule (2).—To find the logarithm of a *five-figure* number where only four figures of the number are printed in the column headed "No.," take the first three figures of the mantissa from column (0), opposite the first four figures of the number, and the last four figures of the mantissa from the column whose heading agrees with the fifth figure of the number, and add the proper characteristic.

Example (2):

log. 10075 (reading 0032451) = 4·0032451
log. 1007·5 (reading 0032451) = 3·0032451
log. 100·75 (reading 0032451) = 2·0032451

The logarithms for numbers containing six figures, from 100,000 to 108,000, can be found in a similar way.

Rule (3).—To find the logarithm of a *six-figure* or *seven-figure* number where only four figures of the number are printed in the column headed "No.," the mantissa for the first five figures is obtained as explained above, and to it is added a proportional part of the difference between that mantissa and the next higher mantissa.

The difference represents the change corresponding to an increase of one unit in the fifth figure of the number, and as the sixth figure represents x-tenths part of the unit, and the sixth and seventh figures x-hundredth parts of the unit, they may be considered as decimals of it. Therefore, if the difference be multiplied by the sixth figure or the sixth and seventh figures of the number in question, the product will be the correction to be added to the mantissa of the first five figures of the number, and, when so added, will give the required mantissa. The insertion of the proper characteristic and the decimal point will then give the complete logarithm of the number.

Example (3): Find the logarithm of 101,058.
Here

$$101{,}058 = 101{,}050 + 8.$$

Then by Table XIA.

log. 10105 = 0045363
log. 10106 = 0045793
difference = 0000430

Then

$$0000430 \times 0{\cdot}8 = 0000344$$

and ·0045363 + ·0000344 = ·0045707

Therefore adding the proper characteristic,

log. 101,058 = 5·0045707

Example (4): Find the logarithm of 1,010,585.
Here

$$1{,}010{,}585 = 1{,}010{,}500 + 85$$

Then by Table XIA.

log. 10105 = 0045363
log. 10106 = 0045793
difference = 0000430

Then

$$0000430 \times 0{\cdot}85 = 00003655$$

and ·00453630 + ·00003655 = ·00457285.

Therefore adding the proper characteristic,

log. 1,010,585 = 6·00457285.

For ordinary calculations the corrections can be taken from the column headed "Diff.," where *differences* and their *proportional parts* are given—every third difference at the beginning, every second difference in the middle, and every difference at the end of the table. In cases where minute accuracy is essential and the exact difference is not given, the values must be calculated by the foregoing method.

It must be understood that the *differences* and their *proportional parts* are really decimal fractions, although printed in the table as if they were whole numbers, and that in each case the significant figures are understood to be preceded by a certain number of ciphers, the exact number being readily obtained by inspection.

Thus in Table XIA:—

difference 433 = ·0000433

Because

log. 10043 = 0018635
log. 10042 = 0018202
difference = 433 = ·0000433

Similarly proportional part 390 = ·0000390 and proportional part 43 = ·0000043.

Because

$$\cdot0000433 \times \frac{9}{10} (= 0{\cdot}9) = \cdot0000390$$

$$\cdot0000433 \times \frac{1}{10} (= 0{\cdot}1) = \cdot0000043$$

Note.—It should be pointed out that the arrangement in which the first three figures of the mantissæ are printed at intervals, and only in column (0), leads to apparent inaccuracy in some lines of a logarithmic table so designed.

Thus, referring to Table XIA. we find that *log.* 10,023 reads 0009977, which is correct, and that *log.* 10,024 reads 0000411, which is manifestly wrong. Similarly, *log.* 107,994 reads 03339963, which is correct, and *log.* 107,995 reads 03330365, which is wrong.

The fact is that, after the value of the last four figures in any mantissa has passed beyond 9999, the value of the last figure in the first group requires to be increased by 1, so that for two of the numbers cited above the figures of the mantissa 000 and 0333 become 001 and 0334 respectively. But to record these increases in the middle of a line would be inconvenient, and to avoid disturbing the symmetry of the table, the figures 000 and 0333 are allowed to remain, the change being indicated by a thin line over the figures affected.

Therefore, to find *log.* 10,024, we must read the last four figures of the mantissa in column (4) opposite number 1002, and the first three figures in column (0) opposite number 1003, thus obtaining *log.* 10,024 = 0010411, which, with the addition of the characteristic, becomes 4·0010411.

In the same way *log.* 107,995 is found to be 5·0330365.

To Find the Number Corresponding to any Given Logarithm.

It may sometimes happen that the exact logarithm for which the number is required will be found in the table, but when this is not the case the value may be ascertained in the following manner:—

Rule (4).—Take from the table the logarithm next lower than that given, and write down the five figures of the corresponding number, which will be correct so far as they go. Then find the difference between the logarithm taken from the table and the given logarithm, and, in the difference column, opposite the proportional part equal to this difference, read the sixth figure of the number. In case the difference column does not contain the exact difference ascertained, take the next lower proportional part, and the number opposite to it will be the sixth figure of the number, but a seventh figure may be required to give a more exact value. The seventh figure is found by subtracting the last-mentioned proportional part from the ascertained difference, appending a cipher to the remainder and considering the result as a new proportional part for which the corresponding figure must be found. This figure will be the seventh figure of the number. The process can be continued if desired until an exact agreement of the differences is reached, or until any required number of decimal places has been found.

Example (5): Find, by the aid of Table XIA., the number corresponding to the logarithm 4·0034295.

Then, dealing only with mantissa
Here we have

given *log.*	= 0034295–	
next lower *log.*	= 0034174	= 10079
difference	= 121–	
next lower pro. part	= 87	= 000002
(append cipher)	340–	
next lower pro. part	= 303	= 0000007
(append cipher)	= 370	
next lower pro. part	= 346	= 00000008
	24	10079278

As the characteristic 4 shows the result will be more than 10,000, but not so much as 100,000, the required number is 10079·278.

Example (6): Find the number corresponding to the logarithm 0·03325376.

Here we have

given *log.*	= 03325376–	
next lower *log.*	= 03325081	= 107957
difference	= 295–	
next lower pro. part	= 284	= 0000007
(append cipher)	= 110–	
next lower pro. part	= 80	= 00000002
	30	10795772

As the characteristic 0 shows the value of the result must be between 1 and 10, it follows that 1·0795772 is the required number.

TABLE XII.—SIX-FIGURE LOGARITHMS OF NUMBERS FROM 100 TO 9,999 WITH DIFFERENCES.

No.	0	1	2	3	4	5	6	7	8	9	D.
100	000000	0434	0868	1301	1734	2166	2598	3029	3461	3891	432
1	4321	4751	5181	5609	6038	6466	6894	7321	7748	8174	428
2	8600	9026	9451	9876	.....	.....	.....	.....	.....	.....	425
2	01.....	.....	.....	.....	0300	0724	1147	1570	1993	2415	424
3	2837	3259	3680	4100	4521	4940	5360	5779	6197	6616	420
4	7033	7451	7868	8284	8700	9116	9532	9947	.....	.....	417
4	02.....	.....	.....	.....	.....	.....	.....	.....	0361	0775	416
5	1189	1603	2016	2428	2841	3252	3664	4075	4486	4896	412
990	995635	5679	5723	5767	5811	5854	5898	5942	5986	6030	44
1	6074	6117	6161	6205	6249	6293	6337	6380	6424	6468	44
2	6512	6555	6599	6643	6687	6731	6774	6818	6862	6906	44
3	6949	6993	7037	7080	7124	7168	7212	7255	7299	7343	44
4	7386	7430	7474	7517	7561	7605	7648	7692	7736	7779	44
5	7823	7867	7910	7954	7998	8041	8085	8129	8172	8216	44
996	998259	8303	8347	8390	8434	8477	8521	8564	8608	8652	44
7	8695	8739	8782	8826	8869	8913	8956	9000	9043	9087	44
8	9131	9174	9218	9261	9305	9348	9392	9435	9479	9522	44
9	9565	9609	9652	9696	9739	9783	9826	9870	9913	9957	43

TABLE XIII.—FIVE-FIGURE LOGARITHMS OF NUMBERS FROM 0 TO 999 WITH DIFFERENCES.

No.	0	1	2	3	4	5	6	7	8	9	D.
0	inf. neg.	0000	30103	47712	60206	69897	77815	84510	90309	95424	—
10	00000	00432	00860	01284	01703	02119	02531	02938	03342	03743	415
11	04139	04532	04922	05308	05690	06070	06446	06819	07188	07555	379
12	07918	08279	08636	08991	09342	09691	10037	10380	10721	11059	344
13	11394	11727	12057	12385	12710	13033	13354	13672	13988	14301	323
14	14613	14922	15229	15534	15836	16137	16425	16732	17026	17319	298
95	97772	97818	97864	97909	97955	98000	98046	98091	98137	98182	46
96	98227	98272	98318	98363	98408	98453	98498	98543	98588	98632	45
97	98677	98722	98767	98811	98856	98900	98945	98989	99034	99078	45
98	99123	99167	99211	99255	99300	99344	99388	99432	99476	99520	44
99	99564	99607	99651	99695	99739	99782	99826	99870	99913	99957	44

Tables XII. and XIII. are examples of *six-figure* and *five-figure* logarithmic tables.

In Table XII. it will be observed that, in places where the values of the last four figures of the mantissæ exceed 9999, the logarithms are continued on a separate line, thus obviating any correction of the kind indicated in the *note* made above in connexion with *seven-figure* logarithms.

The differences given in the column headed (D) in Tables XII. and XIII. enable the user to calculate proportional parts for numbers have more figures than those stated in the "No." columns, as illustrated in the examples following.

Example (7): Find the logarithm of 105·25 by Table XII.

log. 1052 = 022016
D. 412 × 5 = 206
∴ Required *log.* = 2·022222

Example (8): Find the logarithm of 105·2 by Table XIII.

log. 105 = 02119
D. 415 × 2 = 83
∴ Required *log.* = 2·02202

Example (9): Find the number corresponding to the logarithm 0·997925 by Table XII.

given *log.* = 997925
next lower *log.* = 997910 = 9952
D. 44) 15 = 000034
995234
∴ Required number = 9·95234

Example (10): Find the number corresponding to the logarithm 0·98935 by Table XIII.

given *log.* = 98935
next lower *log.* = 98900 = 975
D. 45) 35 = 00077
97577
∴ Required number = 9·7577.

General Building News.

PROPOSED NEW CHURCH, BEDMINSTER.—It is proposed to erect a new church at Bedminster from the designs of Mr. W. V. Gough, of Bristol. The church has been designed to accommodate a congregation of 750, and will include a chancel, nave, two aisles, morning chapel, organ chamber, vestries, and basement. At present it is proposed to build the chancel end, and three bays of the nave with vestries below. The chancel will have an apsidal end—as will also the chancel of the morning chapel—with concrete domes, ultimately to be decorated and coloured. The walls of the building will be constructed of pennant, the interior being relieved by coloured stones and brick facings. The seating accommodation at present will be for 500, and it is proposed to use chairs. When the first part of the scheme has been completed there will then remain three bays to be added, and the entrance porch.

WESLEYAN CHAPEL, BLUCHER, NEAR NEWCASTLE.—A new Wesleyan chapel has just been opened in this village. The buildings, which are of Gothic design, have been erected with Seaton Burn bricks, supplied by the North Walbottle Coal Co., those for facing and the moulded string and label moulds for doors and windows being from Messrs. Jones & Maxwell's works at Pelaw. The church is 40 ft. by 27 ft., capable of seating 160 worshippers, with a Sunday school at right angles 42 ft. by 24 ft., to accommodate 170 children, so arranged that the two rooms can be thrown into one by the removal of a glazed swivel partition. At the rear of the church there are minister's and stewards' vestries, and advantage has been taken of the sloping nature of the site to provide a kitchen vestry, heating chamber, and storerooms in the basement. The woodwork for the pews, seats, rostrum, and dado cleading is executed in pitch pine, the remainder being in redwood stained and varnished. The front windows of the church are glazed with cathedral glass from the studio of Mr. C. J. Baguley, of Newcastle. The heating is on the low pressure system, and has been installed by Mr. Ernest Byles, of Newcastle, the painting and decoration has been carried out by Mr. B. Robertson, and the whole contract by Messrs. Brown & Bell, builders, of Newcastle. Mr. J. J. Winter has acted as clerk of works, under the supervision of Mr. J. Walton Taylor, architect, of Newcastle, who has designed the new premises.

COUNCIL SCHOOLS, ALTRINCHAM.—These new schools, in Navigation-road, Altrincham, were opened on Tuesday, the 24th inst. The schools are arranged in three separate departments and contain accommodation as follows:—Infants' department, 190; junior mixed department, 300; senior mixed department, 300. Special provision is also made for instruction in science and art, cookery, and manual instruction, separate accommodation being provided for these purposes. The total cost of the school is approximately 13,214*l.*, and the work has been carried out from the designs and under the superintendence of Mr. Wm. Owen, Manchester, Mr. Thomas Clayton having acted as clerk of the works. The contractor for the general work is Mr. Wm. Thorpe, Old Trafford.

NEW ELECTRICAL SCHOOL, CHATHAM.—In the construction of the building for the electrical school for H.M. War Office at Chatham, considerable use is being made of reinforced concrete for floor beams of various types, designed in accordance with the Wells system, which, so far as can be judged from the drawings, appear identical with the Hennebique system except in respect of the members for resisting shearing stresses, and as these have one leg only in place of two, we do not think the new form possesses any recommendation. The building was designed by the late Colonel E. C. Moore, R.E., and is being erected by Stuarts Granolithic Stone Co. under the supervision of Colonel A. Hill, R.E. (retired).

SUNDAY SCHOOL ENLARGEMENT, BOURNEMOUTH.—The Sunday school of the Pakesdown Congregational Church is at present being enlarged and improved. The scheme comprises a continuation of the existing schoolroom to a length of 45 ft., by 35 ft. in width, and the addition of four class-rooms, with cloak rooms, lavatories, etc., the construction being of red brick. Mr. R. C. O. Cooper is the architect, and Messrs. Jenkins & Son, Limited, are the builders.

SCHOOLS, BOURNVILLE.—The public elementary schools which Mr. and Mrs. George Cadbury have built at Bournville have just been completed. The schools are designed to accommodate 540 scholars—270 boys and an equal number of girls—and have cost upwards of 30,000*l.* to build, furnish, and equip. They stand in the centre of the village and have frontages to Linden-road and Thorn-road. On the south they are bounded by the village park, and to this the children are to have the privilege of free entry, thus extending their playing space when at school to upwards of ten acres. The buildings have been designed in the Gothic style, freely treated, by Mr. Alexander W. Harvey, consulting architect to the Bournville Village Trust, and their construction has been carried out by Messrs. J. Bowen & Sons, of Birmingham. Their most distinctive feature is a massive square tower, embellished with sculptured stonework, which forms the south-east corner, and furnishes entrances for the girls. These are rendered imposing by bold stone staircase approaches. The boys' entrances are from Thorn-road. The general plan of the building is rectangular, with a hall 84 ft. long and 32 ft. wide in the centre, and twelve class-rooms are arranged around it. The southern aspect is built up from a basement to provide for the natural fall of the land, and in this commodious rooms have been fitted for teaching technical arts and handicrafts to the boys and laundry work and cookery to the girls. In the two upper stories of the tower are a library and a laboratory. The schools are provided with the electric light, and heated and ventilated by a combined system. A distinctive feature of the schools is a carillon of twenty-two bells set in the tower. The bells have been cast by Messrs. Taylor, of Loughborough.

MISSION HALL, SALISBURY.—The new mission hall of the Salisbury branch of the Railway Mission has just been completed. The architect was Mr. A. C. Bothams (City Surveyor), and Messrs. Day Brothers were the builders. The total cost of the building has been about 1,090*l.*

KING'S COLLEGE HOSPITAL.—At the last annual meeting of the court of governors, presided over by the Rev. Dr. Headlam, principal of King's College, the chairman stated that they had received about one-half of the sum of 300,000*l.* for which an appeal is now before the public, and are now in full possession of the site on the Sanders estate, Denmark Hill, presented by the Hon. W. F. D. Smith, M.P., in memory of his father, the late Mr. W. H. Smith, treasurer of the hospital. Building operations will be begun forthwith and the out-patients' department will be the first to be constructed for which the selected architect, Mr. W. A. Pite, has been instructed to prepare working drawings.

FREE CHURCH HALL, ROTHERHITHE.—The new hall of the Rotherhithe Free Church in Lower-road was opened a short time ago. In shape the structure is an elongated octagon, with a span roof. The area has been excavated to the depth of about 6 ft., so that the audience pass down several steps to reach the floor. The platform rails and stair borders are painted white, and will be picked out with gold. When sufficiently dried the walls will be coloured a light green. A system of electric lighting has been installed by Mr. Wilkinson. The architects were Professor Beresford Pite and Mr. W. A. Pite, the builders being Messrs. W. Lawrence & Sons. The scheme also includes the erection of a school-room, book-room, club-room, and temperance hotel, but only the hall has been proceeded with at present. The contract for the main buildings and vestibule was signed for 6,699*l.*, which did not include the cost of lighting, flooring, chairs, etc., which are estimated to cost 750*l.* additional.

PUBLIC LIBRARY, BEVERLEY.—The new public library at Beverley has been completed. The lending library, reference library, and newsroom are all on the ground floor, entered directly from a staircase hall immediately to the left of the entrance hall. In the newsroom stands are provided around the walls for twenty-two or twenty-three newspapers. Adjoining the news-room and separated from it by oak screens is the lending library, with sufficient space to give accommodation for some ten or twelve thousand volumes. The reference library is furnished with tables and chairs for thirty-four readers. On the first floor is a lecture-room, a committee-room, and an art gallery. The latter occupies the whole length of the back part of the building over the lending library and reference room, and is lighted for the most part from the roof. The fittings and internal woodwork are of oak and the floors of the art gallery and lecture-room of blocks of the same wood. The heating through out is by means of hot water in pipes and radiators with a fireplace in addition in the committee-room. The building is illuminated by the incandescent light. The work has been carried out under the supervision of Mr. John Cash, architect, of London. The building contractor is Mr. G. Pape, of Beverley, and the sub-contractors are Mr. Robert Pape, Beverley (stonework), King & Co., Hull (heating), Darlington School Furnishing Company (fittings), Robert Campy, Beverley (painting).

RAILWAY OFFICES, YORK.—The staff of the North-Eastern Railway Company will, during the next few months, enter on possession of their new head offices at York, which have been five years in course of erection. The constructional work was completed last year, and the final stages of internal fitting and decoration are approaching completion. The building occupies the site of a congeries of old tenement property lying between Station-road and Tanner-row, with a main façade to a narrow street which divides it from the old offices. The design won the silver medal at the French Exposition two years ago, and has been exhibited at the Royal Academy. It is a happy result of the co-operation of two architects—not always a successful experiment—Mr. Horace Field, of London, who is mainly responsible for the elevation, and Mr. W. Bell, the chief architect of the North-Eastern Railway, having collaborated with the most harmonious results.—*Yorkshire Post.*

LIVERPOOL COUNTRY HOSPITAL FOR CHILDREN.—The new Liverpool Country Hospital for Children is being erected at Heswall, on an elevated site of 10 acres. When completed the new hospital will provide accommodation for 200 beds, and will be erected in the form of the letter "H." It has not, however, been found possible to proceed with the full scheme all at once. The portion now being undertaken is the central block, some part of which is to be utilised as temporary accommodation for wards until the ward blocks themselves can be erected. The central block will cost 25,000*l.*, and it will eventually be used as the administration block and as playrooms and schoolrooms, and accommodation will be found for 100 beds. The total cost of the whole scheme is to be about 60,000*l.* Messrs. H. & A. P. Fry, of Hackins-hey, are the architects of the new buildings, and the contractor is Mr. W. H. Ford, of Birkenhead.

GLASGOW STOCK EXCHANGE ENLARGEMENT.—The addition to the Glasgow Stock Exchange was opened on the 17th inst. The new wing, which faces St. George's-place, has been erected in conformity with the older building, the design being French Gothic in its treatment. On the ground floor accommodation is provided for the Post Office, which has a floor area twice that occupied by the old premises. Cloak-rooms, etc., have been added for the convenience of the staff, and the remainder of the floor is let for offices. The first or principal floor comprises the new mining market, telephone corridor, and smoking-room. The new mining market is a room about 50 ft. by 42 ft., and 22 ft. in height, and is lighted by three windows facing St. George's-place. It is more than double the area of the old market, which will eventually be thrown into the present general market. The telephone corridor is a spacious apartment, and it will eventually enter to the main staircase in the present building, and will be over 100 ft. in length. The flooring is laid throughout with india-rubber. The smoking room adjoins the mining market and telephone corridor. Practically all the second floor is occupied by the administrative department. This includes the general office, a private room for the secretary, with waiting-room adjoining, and a strong-room and typists' apartment. Communication with the old building is direct. Directly above, on the third floor, are situated the telegraph instruments room, the committee-room, and a number of offices. New lavatories and cloak-rooms have been provided, and the entire building is heated by the Reck system, while an Otis elevator connects all the

floors. The architect is Mr. John James Burnet, St. Vincent-street, Glasgow.

HOTEL, ABERDEEN.—New licensed premises and hotel are about to be erected at the corner of Market-street and Guild-street, Aberdeen. Messrs. Sutherland & Pirie are the architects for the building, which will cost about 6,000*l.*

VICARAGE, OXFORD.—St. Paul's Vicarage, which has been erected on a site at the Woodstock-road end of Observatory-street, Oxford, was dedicated recently by the Bishop of Oxford. The house is of red brick, and has been built at a cost of about 1,500*l.* by Mr. J. Wooldridge, from the designs of Mr. F. C. Eden, Holborn, W.C.

HOSPITAL, FAZAKERLEY, LANCASHIRE.—The new Liverpool City Hospital, which has been opened at Fazakerley, provides accommodation for 350 beds. The administrative block and the nurses' home occupy the central position in the buildings, directly facing the main entrance, while the wards and isolation pavilions are ranged on the east and west sides. The erection of the hospital has been carried out from designs by the Corporation Surveyor, Mr. T. Shelmerdine, and has cost about 121,475*l.*

CO-OPERATIVE BAKERY, BELFAST.—The opening of the Belfast Co-operative Bakery, Ravenhill-avenue, took place on the 16th inst. Mr. W. J. Gilliland was the architect, under whose superintendence the buildings have been erected. The buildings are constructed fireproof throughout. They are principally of best Belfast perforated brick, with white spot stone used in the principal elevation towards Ravenhill-avenue. The walls of the interior of the bakery are lined with enamelled bricks. The general contractors for the building works are Messrs. W. J. Campbell & Son, Belfast. The ovens were erected by Messrs. T. Melvin & Sons, Glasgow, and Messrs. Joseph Baker & Sons, London. The tile work is by Messrs. Craven Dunnill, Ltd., Jackfield. Messrs. Ewing & Lawson, of Glasgow, supplied the steam boiler. Messrs. Green & Son, of Wakefield, erected the economisers and steam pipes. The engines and dynamos are provided by Messrs. Howden & Co., of Glasgow; and the electric installation is by Mr. Stanley Johnston, Belfast. The plumbing and other fittings have been erected by Mr. W. T. Stone, Belfast. The plumbing fittings are supplied by Messrs. Doulton & Co., of London. The baking machinery has been supplied by Messrs. Melvin & Co., of Glasgow, and Messrs. Werner, Pfleiderer, & Perkins, Ltd., of London. Messrs. Musgrave & Co., Ltd., of Belfast, supplied the stable fittings. The electric installation was designed by Mr. Turner, of the Co-operative Society, Ltd., and Mr. Scott, engineer to the United Co-operative Baking Society, Ltd., has arranged the various items of baking machinery.

BOROUGH LIBRARY, STEPNEY.—The Borough Reference Library has been erected at the rear of the Bancroft-road Public Library upon the site of the disused mortuary and yard space adjoining. The building, which was designed by the Borough Engineer (Mr. M. W. Jameson), contains, on the ground floor, a lecture hall 43 ft. in length, 28 ft. 6 in. in width, and 15 ft. in height, and a juvenile reading room 28 ft. in length, 16 ft. in width, and 12 ft. in height. As occasion may require, these two rooms may be thrown into one. The partition dividing them consists of a series of doors swinging on pivots, which allow the whole to be folded against the wall without delay or trouble. The lecture hall is provided with a platform and an ante-room fitted with lavatory for the use of the lecturer. On the first floor is situated the Borough Librarian's office and a chamber to be used as the central reference reading room of the Borough, 60 ft. in length, 28 ft. 6 in. in width, and 20 ft. in height. Each side wall is divided into six, and each end wall into three panels by means of rows of pilasters with an entablature and ceiling cove above. The room is lighted by three windows at each end, in addition to the lights in the ceiling panels. A complete electric light installation has been laid throughout the building, and sufficient switches have been inserted to allow of any light being used independently. To provide for the warming of the rooms a special heating apparatus has been fitted in the newly-formed basement, connected with radiators placed in various parts of the building. Ample provision has been made in the basement for storage purposes, as may be found necessary. The building has been erected by Messrs. Patman & Fotheringham. Special consideration has been devoted to the question of exit in case of fire or other emergency, and by permission of the Mile End Board of Guardians an extra exit has been provided through their premises adjoining, to be used in case of fire only

HOSPITAL EXTENSION, LANSDOWN, BOURNEMOUTH.—A new wing has been added to the Lansdown Hospital and Nursing Home. The work was carried out by Messrs. Erwood & Morris, contractors, from the designs of Messrs. Wilde & Fry, architects.

CHAPTER HOUSE OF THE LIVERPOOL CATHEDRAL.—The foundation-stone of the chapter house of the new cathedral will be laid shortly. It will be erected from funds provided by the Freemasons of the province of West Lancashire as a memorial to the late Earl of Lathom. The architects are Mr. G. F. Bodley, R.A., and Mr. G. Gilbert Scott.

HOTEL ADDITIONS, MARGATE.—The Queen's, Kimber's, and High Cliffe Hotels have recently been converted into one hotel. The necessary alterations were carried out from plans prepared by Mr. R. Dalby Reeve, architect, Margate, the contractors being Messrs. Lockwood, of Westgate.

Stained Glass & Decoration.

MEMORIAL WINDOW, EDENSOR.—The dedication of a stained-glass window placed in the chancel of St. Paul's Church, Edensor, to the memory of the late Alderman E. G. Prince, J.P., a former Mayor of Longton, took place a short time ago. The subject which it depicts is the Birth, Crucifixion, Resurrection, and Ascension of Christ, and it has been erected under the supervision of Mr. J. H. Beckett, architect, by Messrs. Heaton, Butler, & Bayne, of London.

Appointment.

MR. HARRY BLACKADDER, Burgh Surveyor, North Berwick, has been appointed to the surveyorship of Bridge of Allan.

Sanitary and Engineering News.

THE LAW AS TO COMBINED DRAINAGE.—Poplar Borough Council has sent a circular letter to all the Metropolitan Borough Councils upon the question of combined drainage. They call attention to the unsuccessful attempts made by the London County Council in five sessions of Parliament to obtain an amendment of the law in respect of combined drainage by throwing upon owners the cost of maintainance of all combined drainage systems or other drains not approved by proper authority as sewers. They also refer to a deputation from the Metropolitan Borough Councils which waited upon the President of the Local Government Board in June, 1903, to urge legislation on the subject, when a sympathetic reply was given, but nothing was done to give effect to the desires expressed, and point out that the results sought might be achieved if the London County Council were to insert a clause in its next General Powers Bill dealing with the question, a precedent for which course was established by the Corporation of West Ham in its Bill of 1898 (61 & 62 Vic. Cap. 259 Sec. 42) by which a definition of the word "drain" was set forth. In conclusion, the various Borough Councils are asked to co-operate in requesting the London County Council to renew its efforts to amend the law in the direction indicated.

NECESSITY FOR FREE PUBLIC CONVENIENCES.—Dr. Collingridge, the Medical Officer of Health for the City of London, in his Report for last year on the health of London, draws attention to the urgent need of having conveniences available for the portion of the public who cannot always pay the penny demanded at most of the public lavatory places: and more especially in the case of women. Dr. Collingridge says:—"It is not necessary to enter into details as to the serious injury that may be inflicted upon women by the absence of lavatory accommodation. Suffice it to state that serious and life long trouble is at times the result of such absence. This has already been recognised and provision made wherever practicable. While the ill-results are far more serious in the case of women than of men for physiological reasons, yet with the exception of the two places mentioned (Farringdon-street south and Golden-lane) no free accommodation is provided for them, and unfortunately, as long as payment is required, for many it is beyond reach. The largest class of woman for whom free accommodation is needed in the City is composed of girls who carry materials to and from the shops and places where the work is given out. The number of outworkers employed by City firms is considerable (already more than 7,000 have been registered), and of these only a very small proportion live in the City. These outworkers largely employ girls to carry the work to and fro, and these girls have frequently long distances to traverse, often carrying heavy weights. The nature of their employment entails upon them long waiting and need for haste on their return journey. For them no accommodation is provided at the workshop, and they obviously cannot afford to pay out of their scanty earnings even the small amount required for the use of the public convenience, and the present provision being situated in the Northern and Western Districts only, it is not available to many of these women to whom time is money, and who have but little knowledge of the grave consequences that often result from neglect of natural functions. It is necessary that free accommodation be provided for women at each public convenience, and I recommend that this be at once arranged for." We are glad to read further down that on consideration of this Report the Committee decided at once to provide free accommodation at each public convenience within the City.

PROPOSED ESPLANADE, NEW BRIGHTON.—The Wallasey Improvement Bill is now being promoted in Parliament. It provides for the acquisition of the whole of the property known as the Lower Parade (or Ham and Egg Terrace), the Higher Parade, the Palace, the Pavilion, etc., lying between Victoria-road, the shore, Waterloo-road, and Virginia-road. All this is to be demolished, with the exception of the Higher Parade houses, which, after alteration and renovation, are expected to yield a fair revenue towards the payment of loan charges. The site of the single-storied shops, and a strip of the land upon which the other properties stand, will be laid out as ornamental grounds at the rear of the promenade, and the difficulty of the difference between the levels of the Higher Parade houses is to be overcome by the formation of a grass slope or embankment. A café, a few ornamental kiosks, and a large shelter form part of the scheme. Waterloo-road, between Virginia-road and the shore, is to be widened, and enclosures are to be made which will be laid out with trees and shrubs. The balance of the land not required for the promenade and the gardens will be sold, subject to certain conditions, for the erection of boarding-houses, private hotels, and the like. The promenade itself is to be constructed behind a sea wall to be built on the foreshore, and, independently of the decorative strips at the rear, its width will vary from 90 ft. to 100 ft. It will cover the frontage from the Pier to the western boundary of the Marine Park, and a part of the pavement will be so treated as to admit of the laying down of a double line of tram rails at any future time. When the scheme is completed, the promenade will be of a total length of little short of three miles. The cost of the projected works, including the acquisition of the property, is estimated at 152,000*l.*, but it is calculated that, in actual effect, this will be reduced to less than 100,000*l.* when the capitalised values of the renovated Higher Parade dwellings, the café and kiosks, and the proceeds from the re-sale of land are taken into account. The scheme has been designed and prepared by the District Engineer and Surveyor, Mr. Walter H. Travers.

VENTILATION OF SEWERS.—The London County Council has sent a circular letter to the Metropolitan Borough Councils asking whether they are in favour of a suggestion that by-law No. 5 of the series of by-laws (Drainage, etc.) made by the Spring-gardens authority under sec. 202 of the Metropolis Management Act, 1855, should be repealed. The by-law in question requires the provision of a suitable and efficient intercepting trap in every main drain or other drain of a new building. The by-law is made to apply as far as practicable to the reconstruction of drains. The question of its repeal was brought forward some sixteen months ago by the Lewisham Borough Council, that body contending that if a return was made to the old system and the owner of each house compelled to have a ventilation pipe from the highest point of the drain, each one of these pipes would act as a ventilator to the sewer and the surface gratings in the road, in most cases, and act as fresh air inlets.

Foreign.

FRANCE.—On Saturday last Rodin's statue "Le Penseur" was officially inaugurated in its position at the foot of the Panthéon steps, on the axis of Rue Soufflot.——The scheme for a new Mairie in the Rue d'Anjou, for the VIIIth arrondissement of Paris, is again talked of. If carried out, it will be from the plans and designs of M. Nénot, which have been already prepared.——A large School of Chemistry, in connexion with the University of France, is to be built at the corner of Rue Saint Jacques and Rue Gay Lussac; the cost of establishment, about 3,000,000 francs, is to be divided between the Government and the Municipality of Paris.——The Department of Public Instruction has decided on the creation of three new ateliers at the Ecole des Beaux-Arts, devoted to etching, wood-engraving, and lithography. For this latter atelier M. Mauron, President of the Société des Artistes Lithographes Parisiens, has been already chosen as Professor.——M. Dujardin-Beaumetz intends to establish a school of "Paysage et Plein-Air," which is to be installed at St. Cloud.——A new college for girls is to be built at Saint-Dié, under the title of "Collége Jules Ferry."——The monument to Desaix, formerly in the Place Dauphine at Paris, has been restored by M. Vaast, and is to be set up in Desaix's native town, Riom, to which it has been presented by the Paris Municipality.——A monument to the memory of those who perished in the wreck of the *Hilda* is to be erected at Roscoff.——A well-preserved tomb of the Roman age has been discovered at Nîmes, on the margin of the ancient Roman road called "Domi-

tienne." The tomb was that of a lady; and jewels, an alabaster vase, and other objects have been found in it, which, along with the sarcophagus itself, have been placed in the Archæological Museum at Nîmes.——The death is announced, at the age of seventy-eight, of M. Roubard, the sculptor, who was a pupil of Duret and of Hippolyte Flandrin. Among his works may be named the "Joueur de Triangle" which is at the Palace at Fontainebleau, the figures of Tragedy and Comedy in the Théâtre des Celestins at Lyons, and the statue of Pope Urban II. erected at Châtillon-sur-Marne.——The death is announced at Rennes, at the age of seventy-eight, of M. Martenot, architect, a pupil of Blouet and a former Inspecteur at the Louvre. He was, since 1898, a member of the Société Nationale des Architectes Français. He was appointed in 1858 architect to the town of Rennes, and built there the belfry of the Hôtel de Ville, the Lycée, the Savings Bank, the Palais du Commerce, the decoration of the Jardin des Plantes, and the church of Bonne Nouvelle. He also carried out the scheme for bringing the water of the Minette and the Loisance to augment the town water supply. He designed also the Imprimerie Oberthier and the Hospital of St. Yves.

SOUTH AFRICA.—Messrs. Parker & Forsyth, architects, are inviting tenders for erecting a new school and boarding establishment at Villiersdorp.——The tender of Messrs. Peddie & Drummond, of Harrismith, has been accepted for the construction of the new Government schools at Bethlehem, which are to cost 5,000*l.*——In Cape Town the new building for the National Mutual Life Assurance Company of Australasia, Ltd., is nearly completed. The exterior is of granite from the Paarl. Messrs. Baker & Masey are the architects.——At a meeting in Johannesburg of the Master Builders' Union a resolution was passed declining to tolerate any interference by the trades' union with other skilled workmen when employed on any work which may not strictly belong to their own particular trade. The union also affirmed the principle that as far as possible tenders be accepted from members of the Association only.

GERMANY.—BUILDING, TIMBER, AND CEMENT TRADES IN GERMANY.—In his report on the trade of Germany for 1905, Mr. Schwabach, British Consul-General at Berlin, remarks that the year under review has been a good one for German industry and commerce both at home and abroad. The satisfactory economic conditions in the first half of the year became more accentuated and general in the second half. The demand for labour increased to such an extent that in some branches it could not be entirely satisfied by Germans, and necessitated the drafting into the country of Austrian, Polish, and Galician miners, as well as Italian and other foreign builders, labourers, and navvies. Market reports from the iron and coal centres and the textile, chemical, electrical, machine, and metal industries showed increasing orders, especially for home account, and full employment; there was a rise in the prices of a large number of manufactures, the output of coal and the production of iron increased considerably from month to month as compared with the preceding years, and in the building trade and its allied branches remarkable activity prevailed until late in the year. In the timber trade, too, business was brisk, while even the cement industry, which for the last five years has suffered from excessive expansion and ruinous competition, recovered to some extent. Those familiar with the aspect of Germany ten years ago cannot fail to notice the general improvement and greater prosperity; people dress better, houses are built better, numerous new and spacious factories bear testimony to the growing industrialisation, and the communities of small towns and large cities in all parts of the country spend considerable sums on street and sanitary improvements and public buildings. This aspect of increasing prosperity is confirmed by the returns of the savings banks, income tax commissioners, and insurance companies, and with an uninterrupted development at home the foreign trade of Germany is likely to follow an upward course. The imports of cement in 1905 exceeded twice the quantity of 1904, while the exports, though higher than in 1904, were smaller than in 1903 and 1902. Germany imported from Belgium 65,364 tons against only 3,337 tons in the preceding year. Brazil, Chile, Mexico, and Venezuela all imported considerably larger quantities of German cement than in previous years. The exports of cement to the United Kingdom during the years 1900-1905 were as follows:—(Quantity in 1,000 tons): 1900, 12.5; 1901, 33.5; 1902, 33.6; 1903, 36.7; 1904, 29.1; 1905, 16.1. A comparison of the figures for the last five years shows that asphalt, etc., is losing importance as regards the total imports while increasing quantities are being exported. The satisfactory conditions of the labour market in the first half year continued and even improved in the second half of the year. Agriculture and the building trade absorbed during the third quarter large numbers of new hands; the improvement of the coal and iron market enabled the works in August and September to put on new men; employment in the textile industries was good, and in September the machine-building, the electro-technical industries, and the metal trades generally received a fresh impetus. The great labour movements, which in various parts of the country involved 10,000 men, did not interfere seriously with the general aspect of trade and industry. There was no sign of diminishing activity during the last quarter. The iron and steel industries as well as the metal and engineering branches continued very active; in the coal mining industry all orders could not be executed owing to a serious shortage of trucks throughout October and November. Building operations were actively carried on until late in the year. The great activity which has prevailed in the building trade for the past three years was accompanied by numerous labour disputes, but during the year under review they were rather more frequent than heretofore, owing no doubt to the expansion of the trade. Though the tariff movement has been very successful, the aversion of large sections of employers to agreements of this kind is by no means extinct, as testified, more particularly, by the long and bitter disputes at Munich and in the Westphalian district. The struggle at Munich lasted two months. It was caused by the demand raised by the employers in the course of the negotiations for the renewal of the old tariff agreement that the men should sign a declaration that they did not belong to a labour organisation. As, naturally, this demand was not complied with, the employers' association ordered a lock-out, involving about 2,500 men, but through the mediation of the Trade Tribunal an arrangement was ultimately come to and a new tariff established which expires on April 1st, 1908. The wages are fixed as follows:—

	Wages per hour. Average.	Minimum.
	Pfennige.	
Masons	52	47
Carpenters	49	47
Assistants	38	36

From April 1, 1906, masons and assistants receive an additional 1 pf. per hour, and from April 1, 1907, an additional 2 pf. per hour; carpenters receive 2 pf. more per hour from April 1, 1906, and another 2 pf. from April 1, 1907. Ten pf. above the ordinary rates are paid for overtime and 20 pf. extra for night work. A board of conciliation, composed of six labour members and six employers' members under an impartial chairman, will decide differences, the Trade Tribunal forming the court of appeal. On the whole, the compromise was more favourable to the men, though they did not carry all their points, which included a reduction of the working time by half an hour, and the five o'clock stop on Saturdays. The dispute in the Rhenish-Westphalian building trade assumed much larger proportions than the one at Munich, the number of strikers and locked out numbering, at one time, over 20,000 and the struggle lasting sixteen weeks. It began at Dortmund where the organised masons demanded an increase of wages and subsequently struck work. The employers' association immediately threatened a general lock out unless work was resumed at a certain date. When the lock-out proved ineffective it was extended to a number of places in the vicinity, including Essen, Gelsenkirchen, Recklinghausen, Herne, Buer, and Gladbach, where a few months earlier tariff agreements had been concluded which only expire on July 31, 1906. This measure called forth an energetic protest from the Mayor of Essen, who had taken an important part in the conclusion of these tariff agreements, and now declared that the employers were guilty of a breach of contract, and that the municipal building operations which were interrupted through their action would be completed at their expense by the municipal authorities. He also moved a subvention of 1,000*l.* for the locked-out men. The new tariff agreement extends over more than 200 different towns and villages and remains in force until May 1, 1908. It stipulates a ten hours working day (at places where eleven hours were worked so far ten and a half will be worked until April, 1906); fixes wages according to local conditions at from 44 to 55 pf. per hour, increases the rates for overtime by 10 pf. per hour, and provides for the establishment of arbitration boards consisting of eight members, four appointed by the employers and four by the men; and also of a board of appeal composed of an impartial chairman, five members delegated by the labour organisations and five members nominated by the employers' association. All working rules and regulations contrary to the agreement will be considered invalid.

GERMANY.—The decoration of the great hall in the Kaiser Wilhelm Memorial Church is completed; the hall is decorated in white marble, whilst on the east wall there are representations in mosaic of the Prussian Kings from Friedrich Wilhelm onwards.——An exhibition of furniture representing three fully furnished houses is now being held at Biel; the furniture is from designs by and under the direction of Herr E. J. Propper.——The new church at Walenstadt is completed; the building is in Romanesque style, and the windows are from cartoons by Herr Burkhard Mangold.——A summer theatre is to be built at Karlsruhe, from designs by MM. Curjel & Moser.——The new town hall at Leipzig is to be enlarged; the original architect of the building, Professor Licht, is to design the new portion also.

CHILE.—The Chilian "Diario Oficial" of 20th February contains copy of a law establishing throughout the country local bodies entitled "Councils on Workmen's Dwellings." The aim of these bodies is to stimulate the construction of cheap and salubrious dwellings for the working classes, and to take such steps as may be necessary for the improved sanitation of existing cheap dwellings. The law also sanctions the expenditure of 600,000 pesos (about 45,000*l.*) on the construction of dwellings for the minor grades of State employees.—*Board of Trade Journal.*

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. W. S. Weatherley & Mr. Francis E. Jones, architects, have removed from 30 Cockspur-street to 2, Haymarket, corner of Suffolk-place.——Messrs. Frederic Whitfield & Co., wrought steel safe and door manufacturers, have removed their London office and show-room from St. Andrew's Hill to Godliman House, Godliman-street, Queen Victoria-street, E.C.

HOUSING AND IMPROVEMENT SCHEMES, ARMAGH.—On the 9th inst. an inquiry was held in the Court House, Armagh, before Mr. P. C. Cowan, Chief Engineering Inspector of the Local Government Board, on the petition of the urban council, who made application for the sanction of a loan of 15,000*l.* for the erection of artisans' dwellings under the Housing of the Working Classes Act. The sum of 9,000*l.* was asked for the carrying out of an improvement scheme, by which it was suggested to demolish about forty-six houses unfit for human habitation, and on the same site erect about sixty houses. The remainder of the 15,000*l.* was for the proposed erection of forty-eight artisans' houses. Mr. Francis Bergen, C.E., proved to the plans lodged for the proposed scheme, and gave evidence regarding the figures referred to by counsel as the probable cost.

PUBLIC IMPROVEMENT, BARNSTAPLE.—At the Barnstaple Guildhall, on the 10th inst., Mr. M. K. North, M.Inst.C.E., Local Government Board Inspector, held an inquiry with reference to an application by the Barnstaple Town Council for the sanction of the Local Government Board to the alienation of two old cottages, the property of the Town Council, situate at the back of Nos. 95 and 96, High-street, Barnstaple, and lying between that of the premises belonging to the Barnstaple and North Devon Club. Mr. J. Bosson (Town Clerk) said that the owners of the club premises intended to pull down and rebuild and enlarge their premises, it being desired to set back the frontage of the club premises on rebuilding, a great improvement being thereby effected. It was desired to construct on the land a 16-ft. roadway as an approach from the Strand to the High-street property, this to be in substitution for the existing narrow and inconvenient approach thereto. The Town Council applied for the sanction of the alienation of these two cottages for the purpose of effecting this improvement. The Borough Surveyor (Mr. Arnold Thorne), in the course of the inquiry, said that the cottages were absolutely uninhabitable.

A CARTOON BY MAFFEO.—Mr. Coe has recently deposited in the Constable studios, No. 76, Charlotte-street, Fitzroy-square, what is believed to be Maffeo da Verona's original painting, forming one of the designs, in part, of the Inferno for the decoration in mosaic of St. Mark's. In 1610-2 it was resolved to pay Maffeo 5 ducats for each whole figure in his designs to be executed in mosaic by Alvise Gaetano. The mosaic executed from the picture we mention is over the west doorway within the basilica, and no doubt is entertained of the genuineness of the picture as the work of Maffeo.

LEIGHTON HOUSE.—An appeal for contributions towards a sum of 15,000*l.* is made by the Leighton House Committee that they may be enabled to purchase the freehold of No. 2, Holland Park-road, and establish an endowment fund for its up-keep.

BOOK PRESSES, BRITISH MUSEUM.—To the late Dr. Richard Garnett, and his colleague in the Library, Mr. Henry Jenner, is due, it appears, the introduction of the sliding-press, as previously adopted in the Free Library at Bethnal Green, for providing additional means of storing books by means of new presses which are attached to the old ones with hinges.

MODEL OF THE ISLE OF PURBECK.—The Ordnance Survey authorities have just published a guide to the geological model of the Isle of Purbeck, with which they issue a geological map printed in colours, a plate of horizontal sections, and a collotype from a photograph of the model. Copies of the model, which is deposited in the Victoria and Albert Museum, have been executed

for the Geological Museum in Jermyn-street, London, and the museums in Edinburgh and Dublin.

SPARTA MUSEUM.—Mr. M. N. Tod, assistant-director, and Mr. A. J. B. Wace, student, of the British School at Athens, have brought out a detailed catalogue of the contents, consisting of some 800 items, of the museum at Sparta. The text is divided into three sections upon inscriptions, sculpture, and miscellaneous antiquities, with separate introductions which classify and interpret the exhibits. The catalogue is issued by the Clarendon Press.

THE PICTURES IN THE BODLEIAN.—A recent report drawn up by the committee dealing with the restoration of the pictures states that about 350*l.* is required to supplement the amount of 1,400*l.* subscribed by the University and Colleges, and private individuals. A sum of 1,047*l.* has been expended upon the restoration of 128 pictures; amongst those now in the hands of Messrs. F. Haines & Sons, of London, are portraits of Sir Kenelm Digby, and Robert Nelson, author of the "Companion to the Festivals and Fasts." Those already repaired (the framing being entrusted to Messrs. Ryman & Co., of Oxford) comprise portraits of Lady Jane Grey, Frobisher, Halley, Samuel Butler, Sir Henry Savile, and Pepys's friend Dr. Wallis—the restoration of the last-named was undertaken at the charges of the Samuel Pepys Club; there are also Hudson's portrait of John Potter, Archbishop of Canterbury, 1737-47; and Riley's of the first Duke of Ormonde. Portraits of Archbishop Usher, Tycho Brahé, John Sheffield Duke of Buckinghamshire, and of the second Duke of Ormonde, and seventy other pictures will be dealt with, in so far as funds will permit.

NATIONAL GALLERIES, SCOTLAND.—The Bill introduced by Mr. Sinclair, Secretary for Scotland, is based upon recommendations made by the departmental committee, with Mr. Akers-Douglas as chairman, who conducted an enquiry into the administration of the Scottish Board of Manufactures. The Government measure proposes to transfer from the Board to a new body of trustees the management of the Royal Institution, the National Gallery, and the National Portrait Gallery in Edinburgh. The new board will consist of seven members, to be appointed by the Secretary for Scotland. The present officers of the Board of Manufactures are to be transferred to the trustees; the buildings hitherto vested in the old Board are to be vested in the Commissioners of Works, and the charges for their repair and maintenance will be defrayed out of moneys voted by Parliament. An annuity of 2,000*l.* payable under an article of the Treaty of Union and under the Revenue of Scotland Act, 1718, will be transferred, under provisions of the Bill, to the Consolidated Fund.

COLLAPSE OF A WALL IN SHOREDITCH.—One man was killed and two men were injured by the collapse of a wall of a building in Rivington-street, Old-street, Shoreditch, on the 19th inst. Bricklayers were at work on the building, which was being converted into an electric sub-station. Two men were on a scaffold, engaged in facing a wall with glazed tiles, when suddenly the wall fell outwards, bringing down the scaffolding with it. A third man, who was working on the ground was overwhelmed in the *débris*. He was conveyed to the Mildmay Mission Hospital, where, shortly after noon, he died from his injuries. The two other men, who were both cut about the head, were taken to St. Bartholomew's Hospital.

SCOTTISH BUILDING TRADES FEDERATION.—The half-yearly meeting of the Scottish Building Trades Federation was held on the 20th inst. at the Building Trades Exchange, 26, George-street, Edinburgh. Prior to the business proceedings the delegates lunched in the Royal British Hotel—Mr. Patrick Knox, President of the Federation, presiding over a company which included Mr. Gilchrist, Glasgow Master Brickbuilders' Association; Mr. Charles Hegney, President, Glasgow Master Plumbers' Association; Messrs. John Morgan and James Leslie, Aberdeen Building Trades Association; Mr. Hewetson, secretary, Airdrie and Coatbridge Building Trades Federation; Messrs. William Macdonald and David Cook, Inverness Building Trades Federation; Mr. James Harper, Edinburgh Master Plasterers' Association; Messrs. William Thomson, Vice-President; James Millar, Thomas Mackie, Robert Lamb, Simon Slater, and James Cameron, solicitor, secretary of the Edinburgh, Leith, and District Building Trades Association. Mr. Hewetson proposed "The Building Trades Federation," which, he said, was instituted in 1895, and had done good work with excellent results. He hoped shortly they would see more towns in the Federation. Legislation had been proposed calculated to favour workmen in relation to their employers. There was an effort to overturn the Taff Vale decision, which had such wide-reaching effects, and very possibly that would be effected in the present Parliament. They should mobilise their forces and extend the Federation's operations as far as possible. There was at present what had been a prolonged and much regretted depression in trade. They all hoped that within the next few months there would be an improvement, but when it came the trouble would rise, and it would be then that the need of a complete organisation would be felt. That organisation must be carried out if the employers were to be in a position to protect themselves in the questions which assuredly would arise between them and the workmen. One of the aims of the Federation should be the securing of a uniform set of general conditions of contract throughout Scotland. Such a reform was urgently required. The Chairman, in replying, mentioned that the Federation included Aberdeen, Dundee, Inverness, Dingwall, Oban, Kilmarnock, Paisley, Perth, Edinburgh, Hawick, Dumfries, Banffshire, and Alloa. The Federation did not necessarily exist for the purpose of dealing with the men. They had the greatest sympathy with the men, and wanted to take the men along with them. There were many things in which employers had a common interest, such questions, for instance, as the matter of measurements, arbitration, and the conditions of contract, which last were a great burden, and more sometimes than they were able to bear. While the Federation had not done just so well as they might have, on the whole they were progressing slowly, but surely, and doing good work. He mentioned that they were negotiating with various parts of Scotland to get these to join their ranks. Mr. Leslie gave the toast of "The Edinburgh, Leith, and District Building Trades Association," saying that he had always found Edinburgh and Leith builders the men who had been taking the lead in all the affairs connected with the Federation. Mr. Simon Slater replied. The only other toast—"The Delegates"—was proposed by Mr. Robert Lamb, and responded to by Messrs. William Macdonald, Inverness, and John Morgan. At the half-yearly meeting of the Executive of the Federation Mr. Knox again presided. The proceedings were private, but at the conclusion of the business an official report was communicated. It stated that reports on the state of trade were submitted from all the centres, and that without exception these were of a more or less gloomy nature. In Perth, it was reported that building was at a standstill, and that there were no masons in employment there at present. Mr. James Leslie, of the Aberdeen Association, was appointed Vice-President of the Federation. A voluminous correspondence was read by the secretary which showed that he had been in touch with every town of note in Scotland with a view to extending the Federation, and as a consequence of this it was reported that several Associations in the West and North had indicated their desire to become federated with the Scottish Federation. Arrangements were made for visiting these towns. The annual meeting of the Federation was fixed to be held at Edinburgh in September.

HOUSING SCHEME, LINTON.—Mr. E. A. Sandford Fawcett, M.Inst.C.E., Local Government Board Inspector, and Mr. B. T. Kitchin, Architect to the Local Government, recently held an inquiry into the application of the Linton Rural District Council to borrow 1,500*l.* for the purposes of a scheme under Part III. of the Housing of the Working Classes Act, 1890, for the provision of cottages for persons of the working classes in the parish of Linton. Mr. W. Richardson (Clerk of the the Rural District Council) gave the usual particulars as to area and population of the district, and said the Council proposed to purchase 2$\frac{3}{4}$ acres of freehold land for 160*l.* Mr. F. W. Chappell, the Sanitary Inspector, said it was proposed to obtain water by a bore well, 120 ft. deep, with 4 in. inside diameter boring. The buildings were to be constructed in groups of five, and were to have 9-in. party walls.

SIMPSON'S HISTORY OF ARCHITECTURE.—The first volume of this book was issued without an index; we are asked to mention that one has now been prepared and can be had gratis from the publishers, Messrs. Longmans, Green, & Co., 39, Paternoster-row, E.C.

FIRE TESTS WITH ROLLING STEEL SHUTTERS.—The Report No. 111 of the British Fire Prevention Committee gives the particulars of a test with a set of double steel rolling shutter doors, and a single steel rolling shutter door, the shutters being of an American type known as the "Kinnear door," and supplied in London by Messrs. A. L. Gibson & Co. The result of the tests goes to show that a single rolling shutter is not to be depended on as fire-resisting, or at least as stopping the passage of fire, except imperfectly, and the shutter was bulged and otherwise damaged and could only be partially worked and with difficulty after the test. The test with the double shutters showed that though the inner shutter suffered considerably, as in the single-shutter test, it was an efficient protection to the outer shutter, which was reported as undamaged and in working order after a four hours' fire reaching at its hottest to 1,700 degrees Fahr. In this case the inner shutter also kept its alignment and could be worked after the test, though it had buckled a good deal. The result seems to be that double rolling steel shutters of this type constitute an effectual check to the spread of fire. The shutters were 7 ft. wide by 8 ft. high, and over-lapped the wall opening 2 in.; the exact distance between them is not stated in the Report, but it is given approximately by the fact that they were on the opposite sides of a 13 in. wall. The shutters are made of 20 (U.S.) gauge of galvanised steel, the ends of the strips being fitted with small malleable cast nibs.

Capital and Labour.

CONDITION OF THE BUILDING TRADES.—Employment in the building trades continued to show a general seasonal improvement, which was especially marked in the case of painters. Compared with a year ago, however, employment showed little change. Returns received through the Trade Correspondent from sixty-two London employers showed that in the last week of March they paid wages to 11,623 workpeople of all classes, compared with 11,152 in February, and 14,129 in March, 1905. Employment generally in London was rather better than a month ago, but a good deal worse than a year ago. Returns were received from Employers' Associations in seventy-three districts outside London. In two-thirds of these employment was reported as dull generally; at Stratford-on-Avon and Maidstone it was very good, at Birkenhead good, at Ashton and Huddersfield fairly good, and at the remaining towns moderate or fair. Compared with a month ago, no change was reported in fifty-two towns, while in fourteen, including Stockport, Portsmouth, Bournemouth, and Dublin, it was better, and in seven, including Hull, Chatham, and Swansea, it was worse. Compared with a year ago, employment was reported about the same in forty-four towns, worse in nineteen, and better in ten.—*Labour Gazette.*

Patents of the Week.

APPLICATIONS PUBLISHED.*

9,910 of 1905.—G. F. FLETCHER: *Wall or Hoarding Signs for Advertising Purposes.*

This relates to a wall or hoarding sign for advertising purposes, consisting of a raised representation of the article to be advertised, or its containing receptacle stamped or embossed in sheet metal, or other sheet material, deeply stamping or embossing the plate or sheet and suitably inclining those parts which would otherwise project at right angles to the sheet, such inclined parts being afterwards pressed in if desired.

11,048 of 1905.—A. H. GALE: *Traps for Sinks and Basins.*

This relates to a trap for a sink or basin having its limbs disposed in different planes oblique to one another, and having two orifices normally closed by removable plugs and situated the one at the bottom of the trap and the other at or near the summit of the bend towards the exit of the trap.

17,875 of 1905.—C. M. GRAHAM: *Apparatus for Employment in Connexion with "Register" Grates.*

This consists in the combination with a fire grate of an adjustable plate hinged to the top of the grate and arranged to be suspended at an angle or vertically in relation to the grate, and a shutter hinged to the bottom of said plate and adapted to be folded upwardly against it or to be allowed to depend downward in front of the grate bars.

21,141 of 1905.—J. WICKRE: *Building Blocks.*

This relates to a building block formed with a number of apertures arranged in a plurality of series, the apertures of each series having intervening necks, the necks of any series being out of alignment with the necks of either of the other series, two of the series being formed with half length apertures at the ends of the blocks.

22,668 of 1905.—F. C. WOODFORD: *Chimney Tops.*

This relates to a chimney top, consisting of a cylindrical stalk opening into the lower of two dish-like plates having outstanding rims retained at a proper distance apart by flat tubes opening into the rims, the said plates and tubes being surrounded by a band of greater diameter than the rims and held in position by cones opening into the band and into the flat tubes.

22,679 of 1905.—W. C. FAIRWEATHER (G. NIEMEYER): *Sash Windows.*

This relates to a sash window which can be displaced in its own plane and also moved independently at an angle thereto, while lateral racks co-operate with guide bars of the window to produce

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

PATENTS.—*Continued on page 477.*

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, —; Contracts, iv. vi. viii. x.; Public Appointments, xviii.; Auction Sales, xxx.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

Contracts.

BUILDING.

APRIL 30.—ABERAMAN.—HOUSES.—Building twenty-nine houses at Aberaman for the Brynheulog Building Club. Plans, etc., at office of Mr. T. Roderick, architect, Ashbrook House, Aberdare. Endorsed tenders to be sent in to Mr. Fred. Preece, Secretary, Aberaman-gardens, Aberdare, not later than April 30.

APRIL 30.—FRASERBURGH.—VILLAS.—The mason, carpenter, slater, plaster, plumber, painter, and glazier works of villas to be erected for Messrs. Wm. Benzie & T. P. Burnett. Plans and specifications may be seen with Messrs. Reid & M'Robbie, architects and C.E., Saltoun-chambers, Seaforth-street, Fraserburg, who will receive offers until Monday, April 30, at 10 a.m.

APRIL 30.—NEW TREDEGAR.—BUSINESS PREMISES.—New business premises in Commercial-street, New Tredegar, for Mrs. Morgan, "The Dorothy." Tenders, sealed and endorsed, to be delivered not later than April 30. Plans and specifications may be seen with Mr. D. W. Price, Cloth Hall, New Tredegar.

MAY 1.—CAMBRIDGE.—SCHOOLROOMS, ETC.—Cambridge Town Council invite tenders for the erection of teachers' rooms and an iron outside staircase at the Brunswick Council Schools. Plans, etc., may be seen at the office of the architect, Mr. A. P. MacAlister, St. Andrew's-street, where copies of the quantities may be obtained on payment of the sum of 1*l.* 1s. Tenders, endorsed "Tenders for Work at the Brunswick Council School," to be sent to office of Mr. J. E. L. Whitehead, Town Clerk, Guildhall, Cambridge, on or before May 1.

MAY 1.—CLAYFIELD CROSSING.—COTTAGE.—The directors of the Great Western Railway invite tenders for the erection of a cottage at Clayfield Crossing, near Littleton and Badsey Station, Worcestershire. Forms, etc., at the office of the engineer at Wolverhampton Station, between the hours of 10 a.m. and 4 p.m. Tenders, addressed to Mr. G. K. Mills, Secretary, Paddington Station, London, and marked outside "Tender for Cottage at Clayfield Crossing," will be received on or before May 1.

MAY 1.—LLANDILO.—MARKET.—Llandilo and District Cattle Market and Auction Mart Company, Ltd., invite tenders for constructing a cattle market and auction mart adjoining the Llandilo Bridge Station, Llandilo. Plans, etc., seen at office of Mr. Arthur S. Williams, architect and surveyor, Llandilo, and quantities obtained on deposit of 1*l.* Tenders, endorsed "Cattle Market," to be sent not later than May 1.

MAY 1.—MAESYCWMMER.—SHOP.—A shop in North-avenue, Maesycwmmer, for Mr. W. H. White, Cardiff. Plans and specifications may be seen at office of Mr. Wm. Harris, architect and surveyor, Gilfach, Bargoed. Tenders to be sent in on or before May 1.

MAY 1.—RAWMARSH.—CEMETERY WORKS.—Rawmarsh U.D.C. invite tenders for the laying-out, forming roads and paths, drainage, erection of two chapels with central tower and spire, lodge, and outbuildings connected with same, boundary walling, entrance-gates, etc., situate in Haugh-road, Rawmarsh. Names and addresses, accompanied with a deposit of 3*l.* 3s., to the Architect, Mr. J. Platts, High-street, Rotherham, not later than May 1, after which date bills of quantities and form of tender, etc., will be forwarded to parties who have applied only.

MAY 2.—BIRTLEY.—COTTAGES.—North-Eastern Railway Directors invite tenders for the erection of six cottages at Birtley. Plans, etc., upon application to Mr. William Bell, the Company's architect, Central Station, Newcastle-on-Tyne. Contractors will be required to take their own quantities. Sealed tenders, marked "Cottages at Birtley," to be sent to the Secretary, at York, not later than noon on May 2.

MAY 2.—GOOLE.—ALTERATIONS TO PREMISES.—For the whole or several trades, viz.:—Bricklayer and mason, carpenter and joiner, plumber and glazier, plasterer, painter and slater's work, required in the alterations to licensed premises known as "Bromley's Vaults," at the junction of Aire-street and Adam-street, Goole, for Messrs. Hartley's Brewery Company, Ltd., of Snaith. Applications to Messrs. Thomas Winn & Son, architects, 84, Albion-street, Leeds, not later than May 2.

MAY 2.—LONDON.—ECONOMISER AND FAN-ROOM.—Hackney Guardians invite tenders for building an economiser and fan-room, and altering and extending boiler flues at the Workhouse, Sidney-road, Homerton, N.E. Form, etc., at office of Mr. Frank R. Coles, Clerk to the Guardians, Clerk's Office, Hackney Union, Homerton, N.E., where also the plans (as prepared by Mr. L. J. Todd, consulting engineer, of 25, Brooke-road, Stoke Newington, N.) may be inspected. Sealed tenders, endorsed "Economiser and Fan-room at Workhouse," must be delivered not later than 2 p.m. on Wednesday, May 2.

MAY 3.—GLENLIVET.—BUILDINGS.—The mason, carpenter, and slater works for the following buildings, and for the plaster work of Nos. 3, 9, 10, 12, 13, and 14:—(1) Cart sheds, etc., at Tullochallum, Auchendoun; (2) stable and cart sheds at Boghead, Auchendoun; (3) dwelling-house at Bakebrae, Auchendoun; (4) Byres, etc., at Ellivreid, Glenrinnes; (5) cattle and turnip sheds at Achnarrow, Glenlivet; (6) stable and byres at Bochel, Glenlivet; (7) stable and byres at Shenval, Glenlivet; (8) stable, byre, barn, and shed at Newton of Shenval, Glenlivet; (9) dwelling-house at Tomnalienan, Glenlivet; (10) dwelling-house at Tullich, Glenlivet; (11) dog kennels at gamekeeper's cottage, Gallowhill, Glenlivet; (12) dwelling-house at Blairnamarrow, Strathavon; (13) dwelling-house at Largue, Cabrach; (14) dwelling-house at Elrick, Cabrach; (15) stables at Glenmore Lodge. Plans and specifications may be seen at the Gordon-Richmond Estates Office, Drumin, Glenlivet; or with Mr. A. Thomson, architect, Fife-Keith; and offers will be received by Mr. W. Phimister, at Drumin, up till May 3, at 12 o'clock noon.

MAY 3.—GREAT LEIGHS.—ALTERATIONS, ETC., TO SCHOOL.—The Managers of the Great Leighs Council School invite tenders for structural alterations, and building new classroom, to the Council school, Great Leighs. Plans, form of contract, etc., may be inspected at the office of the architect, Mr. Frank Whitmore, 73, Duke-street, Chelmsford, between the hours of ten and five o'clock, on any working day except Saturday. Names and addresses to the architect, on or before May 3. Sealed tenders, endorsed "Tender for Great Leighs School Works," should be sent to Mr. J. W. Nicholas, Secretary, County Offices, Duke street, Chelmsford, not later than May 17.

MAY 3.—PORTOBELLO.—ALTERATIONS TO LIBRARY.—Alterations at public library, etc., in Town House, Portobello. Plan and specification seen at office of Mr. R. Morham, City Architect, Public Works Office, City-chambers, Edinburgh; or at the office of Mr. Baxendine, Registrar, Town House, Portobello, where copies of the specification may be had on deposit of 1*l.* 1s. by crossed cheque. The estimates must be sent to City Architect by 10 a.m. prompt, on May 3, sealed and marked "Tender, Portobello Library," etc.

MAY 3.—PORT TALBOT.—SHOPS, ETC.—Three shops and dwelling-houses at Station-road, Port Talbot. Plans, etc., to be seen at office of Mr. R. O. Clark, C.E., architect and surveyor, Station-road, Port Talbot, between the hours of 10 a.m. and 5 p.m. Tenders are to be sent in not later than 10 a.m. on May 3.

MAY 3.—TAIBACH.—HOUSES AND SHOPS.—Houses and shops at High-street, Taibach, Port Talbot. Plans, etc.; to be seen at office of Mr. R. O. Clark, C.E., architect and surveyor, Station-road, Port Talbot, between the hours of 10 a.m. and 5 p.m. Tenders are to be sent in not later than 12 noon on May 3.

MAY 4.—OVERSEAL.—SCHOOL.—Derbyshire C.C. Education Committee invite tenders for the erection of a Council school at Overseal, together with sanitary conveniences, drainage, and other works connected therewith. Form, etc., may be obtained from the architect. Sealed tenders, upon forms supplied, and endorsed "Tender for Council School at Overseal," are to be sent to Mr. W. H. Simpson, architect and surveyor, The Corridor-chambers, Market-place, Leicester, not later than 10 a.m. on May 4.

MAY 4.—WEST SOMERTON.—SCHOOL ENLARGEMENT.—Norfolk Education Committee invite tenders for the enlargement of West Somerton School. Names to the Secretary, Norfolk Education Committee, 57, London-street, Norwich, at which office plans and specification can be inspected and bills of quantities obtained. Tenders must be delivered by 12 noon on Friday, May 4, addressed to "The Secretary," and endorsed "Tender for West Somerton School."

MAY 5.—BURWARDSLEY.—SCHOOL ALTERATIONS.—Alterations and additions to the school buildings at Burwardsley. Plans and specifications can be seen at the office of Mr. H. Beswick, County Architect, Newgate-street, Chester, and quantities obtained on deposit of 1*l.* Tenders to be sent to Mr. H. Grant Bailey, Clerk, Crypt-chambers, Chester, on or before May 5, endorsed "Tender for Works at Burwardsley."

MAY 5.—THORPE HESLEY.—CHURCH.—New Wesleyan church, Thorpe Hesley, Rotherham. Quantities can be obtained at the office of Mr. A. E. Lambert, architect, 22, Park-row, Nottingham. Plans can be seen at the Wesleyan Day Schools, Thorpe Hesley, any day except Saturday, between the hours of 9 a.m. and 4 p.m. Tenders to be delivered not later than 11 a.m. on May 5.

MAY 5.—YNYSDDU.—HOUSES.—Four houses at Ynysddu for Mr. W. H. Stone, Black Prince Hotel, Ynysddu, Mon. Plans and specification can be seen at the hotel. Tenders, sealed and endorsed, to be delivered to Mr. Stone, at the above address, not later than noon on May 5. Mr. W. A. Griffiths, architect, Pontllanfraith, Mon.

MAY 7.—ALDERLEY EDGE.—LODGE, ETC.—Alderley Edge U.D.C. invite tenders for the erection of a new lodge, boundary walls, fencing, and other work at their new cemetery on the Chelford-road, Alderley Edge. Bills of quantities, etc., from the Surveyor to the Council, Mr. Harold Sheldon, Council Offices, Alderley Edge, by payment of a deposit of 1*l.* 1s. Tenders, sealed and endorsed "Tender, New Cemetery, Alderley Edge," must be delivered at the Council Offices, Alderley Edge, before 12 o'clock, May 7, addressed to Mr. Walter Cobbett, Clerk to the Council, Council Offices, Alderley Edge.

MAY 7.—ASHBY.—CHURCH.—A new Wesleyan church at Ashby, Lincolnshire, near Frodingham. Plans and specifications may be seen at the following address, to which tenders are to be sent not later than 12 o'clock noon on May 7, sealed and endorsed "Tender for Ashby Wesleyan Church." Particulars may be had, upon recipt of a deposit of 2*l.*, of Mr. W. H. Buttrick, architect, 28, Wells-street, Scunthorpe.

MAY 7.—CWMPARC.—CHAPEL.—Enlargement of Parc C.M. Chapel, Cwmparc, together with new assembly-hall and classrooms. Tenders to be delivered to Mr. Thomas Morgan, Ardwyn, Cwmparc, on or before May 7, sealed and endorsed "Tender," with whom also plans and specifications may be seen, or at office of Mr. R. S. Griffiths, architect and surveyor, Excelsior-buildings, Tonypandy.

MAY 7.—LEEDS.—WORKHOUSE ADDITIONS.—Leeds Guardians invite tenders for the bricklayers and masons, carpenter and joiners, plumbers, plasterers, slaters, painters, concreters, ironfounders, tilers, hot-water heating, and electric lighting required in the erection of three new blocks and a master's house at the Workhouse, Beckett-street, Leeds. Names to the architects, Messrs. Thomas Winn & Sons, 84, Albion-street, Leeds, on or before May 7, when bills of quantities will be forwarded. Each application must be accompanied by a deposit of 2*l.* 2s.

MAY 8.—BARNSTAPLE.—LAVATORY BUILDINGS.—New lavatory buildings and general alterations, and for plumbing work in connexion therewith, at the North Devon Infirmary, Barnstaple. Application to Mr. J. C. Southcombe, architect, Barnstaple, from whom plans, specifications, and quantities may be obtained, and tenders to be sent to Mr. J. B. Symons, Secretary, North Devon Infirmary, Barnstaple, on or before May 8.

* MAY 8.—HAMPTON.—PORTER'S LODGE AND PUBLIC CONVENIENCES.—Erection of porter's lodge at Isolation Hospital, Uxbridge-road, Hampton Hill; also two five-stall public conveniences, one in High-street, the other in Bell Hill, Hampton. Drawings, specifications may be seen, and forms of tender obtained, on deposit of 2*l.*, on or after April 23. Sealed tenders, endorsed "Tenders for Lodge, etc.," to be delivered to the Clerk, Public Offices, Hampton, Middlesex, not later than 4 p.m., May 8.

MAY 8.—SOUTHALL.—LODGE, ETC.—Southall-Norwood U.D.C. invite tenders for the erection of a lodge, etc., at the recreation ground. Forms, etc., at office of Mr. Reginald Brown, A.M.I.C.E., etc., Engineer and Surveyor to the U.D.C., Public Offices, Southall, between the hours of 10 a.m. and 4 p.m., and on Saturdays between 10 a.m. and 1 p.m. Sealed tenders, in the envelopes supplied, and endorsed "Tender for Lodge, etc.," must be delivered to the Clerk of the Council not later than 4 p.m. on May 8.

* MAY 8.—WEST HAM.—WHARF WALL.—Construction of new wharf wall on the Channelsea river at Sewage Pumping Station, Abbey-road, West Ham. Plans and specification may be seen, and form of tender, bills of quantities, etc., obtained of the Borough Engineer, Town Hall, West Ham, upon deposit of 1*l.* The contractor is required to enter into a bond with two sureties for due performance of contract, and must not under-let or make a sub-contract. Tenders, endorsed "Tender for New Wharf Wall, etc.," to be delivered at the Town Clerk's office, Town Hall, West Ham, not later than 4 o'clock on Tuesday, May 8.

MAY 10.—NEWBURGH.—CHAPEL.—The mason, carpenter, slater, lath and plaster, plumber, and painter and glazier works to be done in connexion with the renovation of chapel at Newburgh, Aberdeenshire. Plans and specifications to be seen with the Rev. J. S. Loutit, The Manse, Foveran; also copies to be seen with Mr. John Robertson, architect, Inverness, with whom offers are to be lodged on or before May 10.

* MAY 11.—KENT.—SCHOOL.—The Kent Education Committee invite tenders for new Council schools for 230 children at Crockenhill, near Swanley Junction, in accordance with drawings and specifications prepared by Mr. W. H. Robinson, Architect to the Committee, which may be inspected at the office of the Committee between 10 and 4. Persons wishing to tender must send their names to the architect, with deposit of 1*l.*, not later than noon on May 1. Tenders, on the form supplied, to be delivered to Mr. J. C. Hayward, Sessions House, Dartford, before noon, May 11.

* MAY 11.—ROCHESTER.—SCHOOL.—The Kent Education Committee invite tenders for new Council school for 128 children at Cliffe, near Rochester, Kent, in accordance with drawings and specification, prepared by Mr. Wilfred H. Robinson, Architect to the Committee, which may be inspected at the office of the Committee between 10 and 4. Persons wishing to tender must send their names to the architect, with a deposit of 1*l.*, not later than noon on May 1. Tenders, on the form supplied, to be delivered to Mr. J. E. Povey, Union Offices, Strood, Rochester, before noon, May 11.

* MAY 12.—MANCHESTER.—ADDITIONS, ETC., TO SCHOOLS.—The Manchester Education Committee invite tenders for alterations and additions to the Lancasterian Municipal School, Marshall-street, Oldham-road, Manchester. Plans may be seen and a copy of bills of quantities (including specification) may be obtained at the Education Offices, Deansgate, Manchester, on depositing 2*l.* 2s. Tenders, on the official forms and enclosed in envelopes provided, not later than May 12.

* MAY 12.—MANCHESTER.—SCHOOL.—The Manchester Education Committee invite tenders for erection of the Queen-street Municipal School, Bradford, Manchester. Plans may be seen, and a copy of bills of quantities (including specification) may be obtained at the Education Offices, Deansgate, Manchester, on depositing 2*l.* 2s. Tenders, on the official forms and enclosed in envelopes provided, not later than May 12.

MAY 12.—PORTSMOUTH.—ADDITION TO PUMPING STATION.—Portsmouth Corporation invite tenders for proposed additions to the Stamshaw pumping station with new engine pump and rising main in Simpson-road, at Stamshaw, in the said borough. On payment of the sum of 2*l.* 2s. a lithographed copy of the specification, general conditions, and bill of quantities, with form of tender, can be obtained on application to Mr. Alexander Hellard, Town Clerk, Town Hall, Portsmouth, and any further particulars can be obtained at the Borough Engineer's offices at the Town Hall, Portsmouth. Tenders, marked "Tender for Stamshaw Pumping Station, Rising Main, etc.," must be returned not later than 10 a.m. on May 12.

MAY 14.—ENNISKILLEN.—COTTAGES.—Two semi-detached cottages. Tenders to be sent in to Mr. W. Scott, architect, Victoria-terrace, Enniskillen, by May 14.

MAY 15.—NEWBIGGIN.—SCHOOL ALTERATIONS.—Durham County Education Authority invite tenders for alterations to Newbiggin Council School. Forms, etc., at school, and also at office of Mr. W. Rushworth, F.R.I.B.A., architect, Education Offices, Shire Hall, Durham. Sealed endorsed tenders to be delivered to the architect not later than May 15.

MAY 16.—ABERDEEN.—ASYLUM BUILDINGS.—Mason, carpenter, glazier, slater, plumber, plasterer, heating, and iron works of alterations and additions at the north-east portion of the main buildings of Aberdeen Royal Asylum. The plans, etc., may be seen with, and specifications and schedules of quantities obtained from Messrs. Kelly & Nicol, architects, 367, Union-street, Aberdeen, who will point out the work to offerers on Monday, April 30, at 10.30 a.m. Sealed tenders are to be lodged with Mr. A. Scott Finnie, Clerk and Treasurer, 343, Union-street, Aberdeen, not later than May 16.

* MAY 16.—EPPING.—NURSES' AND INFANTS' QUARTERS.—The Epping Board of Guardians invite tenders for nurses' and infants' quarters at the Epping Workhouse. Drawings may be seen, and further particulars and bills of quantities obtained at the office of Mr. H. Tooley, architect, Buckhurst Hill, on depositing 1*l.* 1s. Applications for quantities must be made to Mr. H. Tooley before May 4. Tenders, on forms supplied, and in envelopes provided, to be sent to Mr. R. D. Trotter, Clerk to the Guardians, Epping, before 5 on May 16.

MAY 21.—LOCHGELLY.—BAKERY PREMISES.—The mason, brick, joiner, plumber, concrete, plaster, slater, iron, steel, and glazier works of proposed bakery premises, Lochgelly, for the Lochgelly Co-operative Society, Ltd. Plans and specifications may be seen, and all further information obtained, on application to Mr. James T. Scobie, architect, Dunfermline and Lochgelly. Schedules of measurements may be had from the Secretary, 5, Douglas-street, Dunfermline. The estimates to be lodged with the Secretary, Mr. John Mitchell, on or before May 21, by 10 o'clock a.m., marked "Tender New Bakery Premises," on envelope.

NO DATE.—DENABY MAIN.—COTTAGES.—Hundred workmen's cottages and four lodging-houses at Denaby Main. For particulars apply to the Denaby and Cadeby Main Collieries, Ltd., Denaby Main, near Rotherham.

NO DATE.—ECKINGTON.—ALTERATIONS, ETC.—Alterations and additions to the old police station, Eckington. Plans and specifications and obtain bills of quantities at the offices of Mr. W. Cecil Jackson, architect and surveyor, 29, Knifesmith-gate, Chesterfield.

NO DATE.—GLASGOW.—VILLAS.—For erecting a large number of villa residences on a building estate near Glasgow. Drawings and schedules, etc., supplied by Mr. R. Anderson, 39, Victoria-street, Westminster, London, on deposit of 2*l.* 2s.

NO DATE.—HARROGATE.—ADDITIONS, ETC.—Additions and alterations to St. Robert's Presbytery, Harrogate. Names and references to Mr. W. H. H. Marten, Grove-chambers, Ilkley, when quantities will be sent to those selected.

NO DATE.—MONKSEATON.—VILLA, ETC.—Villa and stables at Monkseaton for Mr. John Turnbull. Apply to Mr. Dixon, architect, Half Moon-chambers, Bigg Market, Newcastle.

NO DATE.—MONMOUTH.—RESIDENCE.—A residence in Redbrook-road, Monmouth, for Mr. H. F. Perkins, Hadnock Court. Names to Mr. Ernest G. Davies, architect, 7, Bridge-street, Hereford; and 25, Agincourt-square, Monmouth, when plans, specification, and form of tender will be supplied.

* NO DATE.—UTTOXETER.—New school for the Staffordshire Education Committee. Names to be sent by May 16 to Mr. Graham Balfour, Director of Education, Stafford, at whose office drawings and specifications can be seen. Quantities supplied on deposit of 1*l.* 1s.

NO DATE.—WHISSONSETT.—HOUSE.—House on farm at Whissonsett, Norfolk, for Mr. John English. Names to Messrs. Walker & Walker, architects and surveyors, Hill-street, Wisbech; and Terrington, St. Clement.

ENGINEERING, IRON, AND STEEL.

APRIL 30.—BENGAL.—DECK SPANS.—Bengal and North-Western Railway Company Directors invite tenders for the supply and delivery of 100 ft. deck spans. Tenders, addressed to Mr. Alexander Izatt, Managing Director, 237, Gresham House, Old Broad-street, London, E.C., and marked "Tenders for Spans," are to be lodged not later than noon on April 30. For each specification a fee of 10s. will be charged, which cannot be returned.

APRIL 30.—COVENTRY.—TANK.—Gas Committee of Coventry Corporation invite tenders for the supply and erection of a cast-iron covered tank, 25 ft. by 17 ft., by 5 ft. deep. Also for joists and plates, to form floor of pump-house, 12 ft. by 20 ft. Form, etc., on application to Mr. Fletcher W. Stevenson, Engineer and General Manager, Gasworks, Coventry, and upon payment of 10s., which will not be returned. Tenders must be delivered, addressed to the Chairman of the Gas Committee, Gasworks, Coventry, not later than first post on April 30.

MAY 1.—KINGSTOWN, IRELAND.—BATHS.—Kingstown U.D.C. invite tenders from building contractors for the construction of new baths at Sandycove, Kingstown. Plans, etc., can be seen at the office of the Town Surveyor, Town Hall, Kingstown, any day between the hours of 10 a.m. and 4 p.m., Sundays excepted. Tenders will be received by Mr. M. A. Manning, Town Clerk, Town Hall, Kingstown, up to and on May 1.

MAY 3.—NANTWICH.—PIPES.—Nantwich U.D.C. invite tenders for about 416 yds. 12-in. cast-iron pipes; 9 ft. exsoc. lead joints. Also a quantity of 12-in. cast specials. All pipes and specials to be coated outside only with Dr. Angus solution. Also one rectangular steel main, 19 in. by 6 in. by 20 ft., delivered to Nantwich Station. Tenders, endorsed "Tender for Main Pipes," to be sent in not later than May 3, addressed to Mr. A. E. Whittingham, Clerk to the Council, 7, Mill-street, Nantwich. Specification from Mr. D. H. Davies, Manager, Gas Offices, Nantwich.

MAY 4.—CAERAU.—VERANDAHS, ETC.—Llandaff and Dinas Powis R.D.C. invite tenders for (*a*) cast-iron verandahs and (*b*) wrought-iron roof for laundry, in accordance with specifications, which may be obtained on application to Mr. J. H. James, Architect, 18, Quay-street, Cardiff. Tenders, sealed and endorsed, to be sent to Mr. M. Warren, Clerk, Park House, Cardiff, not later than noon on May 4.

MAY 4.—NORTHFLEET.—SWIMMING BATH.—Tenders are invited for the construction of a swimming bath, 80 ft. by 30 ft., at Factory Hall, Northfleet. Plans and specifications may be seen at the office of Mr. W. H. Steadman, Secretary, between the hours of 10 a.m. and 8 p.m., and tenders, marked "Tenders for Swimming Bath," must be delivered before May 4.

MAY 4.—STRANRAER.—WATER WORKS.—The Town Council of Stranraer invite tenders for the construction of a concrete dam, the diversion of a farm road, the construction of a new filter and the rearrangement of existing filters, and other works connected with the water supply of the burgh. Drawings may be seen, and form of tender, etc., obtained, at the office of Mr. Gilbert Thomson, C.E., 164, Bath-street, Glasgow, on payment of a deposit of 2*l.* 2s. Sealed offers, marked "Tender for Water Works," to be lodged with Mr. Wm. Black, Town Clerk, Town Clerk's Office, Stranraer, not later than 12 noon of May 4.

MAY 4.—WALSALL.—HEATING, ETC.—The installation of a system of heating and hot-water supply, laundry alterations, etc., for Walsall and District Hospital. Plans and specifications can be seen on application at the hospital between the hours of 10 a.m. and 5 p.m. Tenders are to be sent to Mr. E. J. Brookes, Chairman, Leicester-street, Walsall, before noon, May 4.

MAY 5.—BEVERLEY.—WALL, ETC.—The Corporation of Beverley invite tenders for (*a*) the construction of a concrete retaining wall on piled foundations at their wharf on the River Hull, at Grovehill, Beverley; (*b*) the supply and erection of wrought-iron fencing at Queensgate Cemetery, Beverley; (*c*) the carrying out of private street works in Prince's Gardens, Beverley. Forms, etc., on application to Mr. J. Gould Smith, Assoc.M.Inst.C.E., Guildhall, Beverley. Sealed tenders, accompanied by priced quotations, endorsed respectively (*a*) "Concrete Wall, Grovehill," (*b*) "Cemetery Fencing," and (*c*) "Prince's Gardens," to be sent to Mr. J. Willis Mills, Town Clerk, Beverley, not later than 12 o'clock noon on May 5.

MAY 5.—JEDBURGH.—WATER SUPPLY.—The Town Council of the Burgh of Jedburgh invite tenders for the works connected with providing an additional water supply for the burgh. Plans and specifications of the works may be seen at the Town Clerk's Office. Schedules of quantities may be obtained from the Town Clerk or Mr. R. J. Charters, Burgh Surveyor, the engineer of the works. Sealed tenders, marked "Tender for Water Works," must be lodged with the Town Clerk on or before May 5, at noon.

MAY 8.—BOMBAY, ETC.—BRIDGEWORK.—Bombay, Baroda, and Central India Railway Company Directors invite, up to noon on Tuesday, May 8, tenders for the supply of steel and cast-iron bridgework. Tenders must be made on a form(copies of which, with specification, can be obtained from Mr. T. W. Wood, Secretary, Gloucester House, Bishopsgate-street Without, London, E.C., on payment of 1*l.* 1s. each, which will not be returned.

MAY 9.—BURMA.—STEEL TYRES.—The Board of Directors of the Burma Railways Company, Ltd., invite tenders for the supply of 500 steel tyres for carriage and waggon wheels. Forms, etc., at the Company's offices, 199, Gresham-house, Old Broad-street, E.C. For each specification a fee of 10s. will be charged, which will not be returned. Tenders, enclosed in sealed envelopes and marked "Tender for Steel Tyres," must be delivered not later than noon on May 9.

MAY 11.—WOLVERLEY.—BRIDGE.—Worcestershire C.C. invite tenders for rebuilding in brickwork Bury Hall Bridge, at Wolverley, near Kidderminster. Forms, etc., on payment of 1*l.* 1s., from Mr. J. H. Garrett, County Road Surveyor, Shire Hall, Worcester. Sealed tenders, marked "Tender for Bury Hall Bridge," to be delivered on or before May 11.

MAY 12.—MIDDLEWICH.—WATER MAIN.—Middlewich U.D.C. invite tenders for the supply of about twelve miles of 8-in. cast-iron socket and spigot water pipes, also for 8-in. valves and automatic air valves. Particulars, etc., on application by letter to Mr. Frederick W. Stocks, Engineer, Town Hall, Middlewich. Sealed tenders, endorsed "Water Main," to be delivered to Mr. C. F. Lawrence, Clerk to the Council, Town Hall, Middlewich, on or before May 12.

MAY 12.—SALFORD.—TRAMWAY FEEDER BOOSTERS.—Salford Corporation Electricity Committee invite tenders for the supply, delivery, and erection at their Frederick-road sub-station, Frederick-road, Pendleton, of two tramway feeder boosters, etc. Specifications and form of tender can be obtained on application to the Borough Electrical Engineer, Frederick-road, Pendleton, Salford, on payment of 1*l.* 1s. Sealed tenders, endorsed "Tender for Tramway Feeder Boosters," to be delivered at office of Mr. L. C. Evans, Town Clerk, on or before Saturday, May 12.

MAY 15.—CLARE.—PIPES.—Clare R.D.C. invite tenders for the supply and delivery at Clare of about 170 tons of cast-iron water pipes and specials, 4 in. and 3 in. diameter, and other works. Specification and bill of quantities may be obtained from the engineers, Messrs. Sands & Walker, Milton Chambers, Nottingham, on payment of 2*l.* 2s. (by cheque). Sealed and endorsed tenders to be sent to Mr. S. L. Bigmore, Clerk to the Council, Haverhill, Suffolk, on or before 10 a.m., May 15.

MAY 15.—CLARE.—WATERWORKS.—Clare R.D.C. invite tenders for the carting, excavating for, and laying and jointing of about three miles of 4-in. and 3-in. cast-iron water mains, including fixing valves, hydrants, etc.; the erection of brick service reservoir, pumping station, and all works in relation thereto. Plans, forms, etc., from the engineers, Messrs. Sands & Walker, Milton-chambers, Nottingham, on payment of 2*l.* 2s. (by cheque). Sealed and endorsed tenders to be sent to Mr. S. L. Bigmore, Clerk to the Council, Haverhill, Suffolk, on or before 10 a.m., May 15.

NO DATE.—MACHYNLLETH.—COFFER DAMS.—Tenders are invited for the construction of three timber coffer dams for bridge work in the River Dovey near Machynlleth. Specification and drawings of work can be obtained on application to Mr. J. Clifton Robinson, 74, High-road, Chiswick, London, W.

MISCELLANEOUS.

APRIL 30.—CHESTERFIELD.—SCAVENGING.—Chesterfield R.D.C. invite tenders for the term of three years from May 12 next, for cleansing the ashpits, privies, and dustholes, in the parish of Eckington, and removing the contents of the same. Forms can be obtained from Mr. H. Attenborough, Sanitary Inspector, Queen-street, Eckington. Tenders (stating the price per house per annum at which the person tendering is willing to undertake the work) must be delivered to Mr. R. F. Hartwright, Clerk to the Council, Union Offices, Chesterfield, not later than 4 p.m. on April 30, endorsed "Tender for Cleansing Ashpits."

APRIL 30.—NEWBURY.—WATER CART.—Newbury R.D.C. invite tenders for supplying a cylindrical water cart to hold 30 gallons, mounted on springs, and fitted with drop valve and hose for flushing purposes. Tenders, to be endorsed "Water Cart," and to be sent to Mr. W. Church, Inspector and Surveyor, not later than April 30.

APRIL 30.—RICHMOND.—MOTOR-WAGGONS.—Richmond (Surrey) Corporation invite tenders for the supply of two steam motor-waggons, each having interchangeable bodies—*i.e.*, water tank having a capacity of 1,000 gallons, and waggon body having a capacity of 7 cubic yds. Further particulars may be obtained on application to Mr. J. H. Brierley, Borough Surveyor, Town Hall, Richmond, Surrey. Sealed tenders, properly endorsed, to be delivered, or sent, to Mr. Fredk. B. Senior, Town Clerk, Town Hall, Richmond, Surrey, not later than 4 p.m. on Monday, April 30.

MAY 1.—ANTRIM.—HEATING APPARATUS.—Antrim C.C. Proposal Committee invite tenders for heating apparatus in Court-house, Antrim. Cost not to exceed 40*l.* Specification, etc., from the Secretary of the Council, County Court-house, Belfast. The tenders will be opened and security taken at the County Court-house, Belfast, May 1, at 11.15 a.m.

MAY 1.—MACCLESFIELD.—FOUNDATIONS.—Macclesfield Corporation Gas Committee invite tenders for the excavating and concreting required in the foundations of a gas-holder tank. A copy of the specification may be obtained, and the drawings seen, at the Gasworks, Macclesfield, on application to Mr. Wm. Newbigging, and on deposit of 1*l.* 1s. Sealed tenders, endorsed "Foundations Contract No. 1," to be addressed to the Chairman, Gas Committee, Town Hall, Macclesfield, to reach him not later than noon on May 1.

MAY 1.—POOLE.—QUARRYING, ETC.—Poole R.D.C. invite tenders for quarrying, sifting, breaking, and yarding gravel, to pass a 2-in. ring gauge (rings will be supplied by the Surveyor), and for team work connected therewith, in the parishes comprised in the district. Forms, etc., can be had from Mr. R. T. S. Seymour, District Surveyor, Wimborne Minster. Sealed tenders to be sent not later than May 1.

MAY 1.—WILLESDEN.—CARBONS.—Willesden U.D.C. invite tenders for the supply of carbons required for their public arc lamps during the ensuing twelve months. Form of tender, etc., may be had from Mr. J. G. Bruce, Resident Electrical Engineer, Electricity Office, Salisbury-road, Kilburn, N.W., to whom tenders, endorsed "Tender for Arc Lamps Carbons," must be addressed and delivered before 10 a.m. on May 1.

MAY 1.—WILLESDEN.—MOTORS.—Willesden U.D.C. invite tenders for the supply and delivery of direct-current motors for letting to consumers on the hire or hire-purchase system. Form of tender, etc., may be had from Mr. J. C. Bruce, Resident Electrical Engineer, Electricity Office, Salisbury-road, Kilburn, N.W., to whom tenders, endorsed "Tender for Motors," must be addressed and delivered before 10 a.m. on May 1.

MAY 2.—MANCHESTER.—CABLE.—Manchester Electricity Committee invite tenders for the supply and delivery of about 13½ miles of ½ sq. in. vulcanised bitumen cable, for a working pressure of 700 volts. Forms, etc., from Mr. Fredk. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester. Tenders, duly endorsed and addressed to the Chairman of the Electricity Committee, must be delivered at the Town Hall not later than noon on May 2.

MAY 5.—BRAMPTON.—CARTING.—Brampton and Walton U.D.C. invite tenders from ratepayers in the Council's district, for the carting of road material for the ensuing year. Particulars and forms of tender may be obtained from the Surveyor, Mr. W. J. Nichols, Cutthorpe, to whom all tenders must be sent on or before May 5, endorsed "Tender for Carting."

MAY 7.—WARRINGTON.—WOOD BLOCKS.—Warrington Paving and Sewerage Committee invite tenders for 80,000 9-in. by 5-in. by 3-in. Karai or Jarrah wood blocks, delivered Warrington. Any further information may be obtained at the office of the Borough

Surveyor, Town Hall, at which place tenders must be delivered before 12 o'clock on May 7.

MAY 8.—HALIFAX.—ROOF COVERS FOR CARS.—Halifax Tramways and Electricity Committee invite tenders for the equipment of twelve cars with roof covers. Sample car may be inspected at the Skircoat-road Depôt. Specifications may be obtained on application to the Tramways Manager, Skircoat-road Depôt. Tenders, endorsed "Roof Covers," must be sent to Mr. Keighley Walton, Town Clerk, on or before May 8.

MAY 14.—DUBLIN.—SLEEPER BLOCKS.—Great Northern Railway Company (Ireland) invite tenders for the supply of 30,000 10-in. by 10-in. sleeper blocks. Specification and form of tender can be obtained from Mr. T. Morrison, Secretary, Secretary's Office, Amiens-street Terminus, Dublin, on payment of a fee of 1s. each. Tenders, which must be made out on the forms supplied by the Company, and endorsed "Tender for Sleeper Blocks," should be delivered not later than 1 a.m. on May 14.

NO DATE.—BRANDON.—HEATING.—Trustees of the P.M. chapel, Brandon Colliery, Co. Durham, invite tenders for the installation of a heating apparatus for school and chapel. Applicants apply to Mr. R. Halliday, 21, Albert-street, Brandon Colliery, Co. Durham.

PAINTING, etc.

APRIL 30.—MELROSE.—PAINTING.—The Roxburgh, etc., District Board of Lunacy invite tenders for the painter work required to be done in the new wing for female patients at the Asylum, Melrose. Schedules of quantities will be supplied, not later than April 30, by Messrs. Sydney Mitchell & Wilson, 13, Young-street, Edinburgh, the Architects to the Board.

* MAY 3.—POPLAR BURTON.—CLEANING AND PAINTING.—The Midland Railway Company invite tenders for (1) cleaning and painting at Poplar Goods Depôt, London; and (2) cleaning and painting engine sheds, etc., at Burton. Specifications may be seen, quantities and particulars obtained, on application at the Engineer's Office, Derby. Sealed tenders by post to the Secretary of the Way and Works Committee, Midland Railway, Derby, before 9 a.m., May 3.

* MAY 3.—SKIPTON-INGLETON.—PAINTING.—The Midland Railway Company invite tenders for painting, etc., to buildings, etc., at Skipton and Ingleton. Specification may be seen, quantities and particulars obtained, on application at the Engineer's Office, Derby. Sealed tenders by post to the Secretary of the Way and Works Committee, Midland Railway, Derby, before 9 a.m., May 3.

MAY 7.—STAFFORD.—PAINTING.—Stafford Corporation invite tenders for painting bridges and fencing, also for the exterior painting of Elmhurst, Tillington, and the thirty-one municipal cottages, Crooked Bridge-road. Forms of tender and other particulars can be obtained on application to Mr. Wm. Blackshaw, Borough Engineer, Borough Hall, Stafford. Sealed tenders (in official covers) shall be delivered at the Town Clerk's Office, Martin-street, Stafford, not later than 10 a.m., May 7.

MAY 9.—EASINGTON.—PAINTING.—Durham County Education Committee invite tenders for painting and colouring the following schools during the mid-summer holidays, viz.:—Haswell and Station Town, windows inside, and wood and ironwork outside only: Trimdon Foundry; Wheatley Hill; Wingate; and Wingate Grange. Forms, etc., stating for which school or schools same are required, may be obtained from the District Clerk, and must be returned on or before May 9 to Mr. C. Neate, District Clerk, Haswell, Sunderland.

* MAY 10.—SOUTHWARK.—PAINTING, ETC.—Whitewashing, cleaning, and painting work at the Infirmary, East Dulwich-grove, S.E., for the Southwark Guardians. Specifications, etc., can be obtained from the Infirmary Steward, as above, between 10 a.m. and 4 p.m. Tenders, endorsed "Painting, etc.," addressed to the Guardians, to be delivered at the Union Offices, John-street West, Blackfriars-road, S.E., by 4 p.m., May 10.

* MAY 14.—WEST HAM.—CLEANSING, REPAIRS, AND PAINTING of schools to be executed during the summer vacation for the Education Committee of the County Borough of West Ham. Persons wishing to tender to make written application to Mr. William Jacques, Architect to the Education Committee, 2, Fen-court, E.C., for copy of specification and form of tender on or before May 5. A deposit of 5*l.* to accompany the application. Sealed tenders in the envelope supplied to be sent to Education Department, 95, The Grove, Stratford, E., before 5.30 p.m., May 14.

NO DATE.—NEWCASTLE.—PAINTING.—Newcastle-upon-Tyne Education Committee invite tenders for painting and cleaning of several schools. For particulars apply to Mr. Alfred Goddard, Secretary, Education Offices, Northumberland-road.

NO DATE.—SEAFORTH.—PAINTING, ETC.—Painting and decorating the Congregational Church, Seaforth. Apply, in first instance by letter, to Mr. W. T. Banbrook, 12, Cecil-road, Seaforth.

ROADS, SANITARY AND WATER WORKS.

APRIL 30.—SHARDLOW.—SCAVENGING.—Shardlow R.D.C. invite tenders for the removal of night soil, house refuse, etc., in the parish of Draycott, from May 1, 1906, to April 30, 1907. Forms, etc., can be obtained from, and tenders must be sent to, Mr. J. W. Newbold, Clerk to the Council, Becket-street, Derby, not later than April 30, endorsed "Scavenging, Draycott."

MAY 1.—NEW MALDEN.—U.D.C. of the Maldens and Coombe invite tenders for the making up of Blagdon-road, New Malden (about 2,000 ft. in length), and also for the construction of about 750 ft. of 9-in. surface water sewer in the above road. Form, etc., obtained from the office of the Engineer and Surveyor to the Council, Council Offices, New Malden, upon the deposit of a postal order for 1*l.* 1s. Tenders must be sent to Mr. C. T. Lewis, Clerk to the Council, Council Offices, New Malden, in the printed envelope, and must be sealed and endorsed "Tender for Blagdon-road," and must reach the Clerk not later than 12 o'clock on May 1.

MAY 1.—OLDHAM.—PAVING.—Oldham Surveyor's Committee invite tenders for the paving, flagging, and completing of Frederick-street, from Chamber-road to Hollins-road. Forms, etc., obtained at the office of the Borough Surveyor. Sealed tenders, endorsed "Tender for Private Street Works," and addressed to "The Chairman of the Surveyor's Committee," to be returned not later than May 1.

MAY 2.—BARLESTONE.—SEWERS.—Market Bosworth R.D.C. invite tenders for providing and laying about 340 yds. of 9-in. and 44 yds. of 6-in. earthenware socket pipe sewers, together with a manhole and settling tank at Barlestone. Plans and specifications may be seen on application to Mr. W. M. Sykes, Surveyor to the Council, Chapel-street, Ibstock, between the hours of 9 a.m. and 11 a.m. Sealed and endorsed tenders must be sent in to Mr. Frank Bouskell, Clerk to the Council, Market Bosworth, Nuneaton, not later than 10 a.m. on May 2.

MAY 2.—HOVE.—ROADS.—Hove Corporation invite tenders for laying a stoneware pipe sewer for a length of 732 ft. in Portland-road, between Titian-road and School-road flint carriageway, and form paths in Portland-road between Rutland-gardens and School-road. Further particulars may be obtained, and drawings and specifications seen, at the Borough Surveyor's Office, Town Hall, Hove. Tenders, on forms supplied, addressed to Mr. H. Endacott, Town Clerk, Town Hall, Hove, and endorsed "Tender for Portland-road Works," will be received up to 6 o'clock on May 2.

MAY 3.—LEISTON.—SEWERING.—Leiston-cum-Sizewell U.D.C. invite tenders for providing and laying about 423 yds. of 9-in. pipes with manholes, gullies, etc., in accordance with the drawings and specifications, which may be seen at the office of Mr. James Baldry, Snape-road, Leiston, Surveyor. Tenders, sealed, and marked "Sewering," to be sent to Mr. John Fry, at his office, Saxmundham, Clerk of the Council, by May 3.

MAY 4.—BURGHEAD.—ROADS.—Forming roadways and laying concrete foot pavements in King-street and Park-street for the Town Council. Plans and specifications may be seen at the Burgh Surveyor's Office, and tenders lodged with him, on or before May 4. Mr. James Jameson, Burgh Surveyor, 77, High-street, Elgin.

MAY 5.—LEEDS.—PAVING, ETC.—Leeds Highways Department invite tenders for the paving and flagging of the following streets:—Harold-grove, Back Harold-grove, Western-road, Western-view, Western-terrace, Western-grove, Western-mount, Western-street, Warrels-road, and Stratford-street. Plans and specifications may be seen at the City Engineer's Office, Municipal-buildings. Tenders on forms supplied, must be sent to the Town Clerk's Office, on or before May 5, addressed to the Highways Committee, and endorsed "Tender for Private Street Works."

MAY 7.—SURBITON.—SEWER.—The U.D.C. of Surbiton invite tenders for the construction of a 9-in. sewer, with manholes, flushing tanks, etc., and reconstruction of house drains at Oak Hill-grove in the above urban district. Tenders, made out on the form and sealed in envelopes supplied, must be delivered at District Council Offices at or before 10 a.m. on May 7. Plans, etc., inspected, and a copy of the surveyor's estimated quantities obtained, on application to the surveyor during office hours. The quantities will not be supplied until the plans and specification have been inspected.

* MAY 8.—WEST HAM.—STREETS.—Making up part of the following:—Drew-road, Leonard-street, Wythes-street, and also Lord-street. Plans may be seen, and specifications, form of tenders, etc., obtained at the Borough Engineer's Office, Town Hall, West Ham, upon deposit of 1*l.* Contractor is required to enter in a bond with two sureties for due performance of contract, and must not underlet or make a sub-contract. Tenders, endorsed "Tender for Private Street Works," to be delivered at Town Clerk's Office, Town Hall, West Ham, not later than 4 o'clock on Tuesday, May 8.

MAY 9.—SWINTON.—BACTERIA BED.—Swinton and Pendlebury U.D.C. invite tenders for the construction of a bacteria bed at the Swinton Sewage Works. Plans, etc., on application to Mr. Henry Entwisle, Surveyor of the Council, Council Offices, Swinton. Sealed tenders to be returned in the envelope provided not later than May 9.

MAY 10.—WARE.—ROADS.—Ware U.D.C. invite tenders for sewering, levelling, paving, kerbing, metalling, channelling, and making good Cross-street, Garland-road, and Raynsford-road, Ware. Forms, etc., at the office of the Surveyor to the Council, New-road, Ware. Tender, in sealed envelope, endorsed "Street Improvement," addressed to Mr. Geo. H. Gisby, Clerk to the Council, Town Hall, Ware, Herts, to be delivered not later than 4 p.m. on May 10.

* MAY 14.—ACTON.—NEW SEWERS.—The Acton U.D.C. invite tenders for construction of three and three-quarter miles of sewers, varying from 6 in. to 6 ft. in diameter, 2¾ acres of filter beds and works connected therewith. Instructions for tender and form of tender, with the form of contract and schedules annexed, can be obtained, and drawings inspected, at office of Sir Alex. Binnie & Sons, 9, Great George-street, Westminster, on payment of 2*l.* Tenders, inclosed in sealed cover, and addressed in manner provided in the instructions for tender, must be received at the offices of the Clerk to the Acton U.D.C., 242, High-street, Acton, before May 14.

* MAY 14.—CRAWLEY AND IFIELD.—SEWERAGE WORKS.—The Horsham R.D.C. invite tenders for 7,784 yds. of earthenware pipe sewers, ranging from 7 in. to 15 in., with necessary tanks, pumping station, engines, and pumps, percolating filters, and laying-out of a sewage irrigation area, and other works in the parishes of Crawley and Ifield, Sussex. Drawings may be inspected, and copies of specification, quantities, and form of tender obtained on application to Mr. Sidney R. Lowcock, engineer, 50, Queen Anne's-gate, Westminster, between 10 and 4.30, on payment of 5*l.* Sealed tenders, endorsed "Tenders for Crawley and Ifield Sewerage," to be delivered to Mr. A. C. Coole, Clerk, Council Offices, 9, Carfax, Horsham, Sussex, before noon, May 14.

* MAY 14.—ENFIELD.—SEWAGE DISPOSAL.—The Cheshunt U.D.C. invite tenders for the construction of an addition to existing engine-house, a tank, No. 4 filters, the supply and erection of engines and centrifugal pumps in duplicate, the laying out of land, together with all necessary carriers, mains, etc., at sewage disposal works at Enfield, Middlesex. Drawings and specifications may be seen on and after April 30 at the offices of the Engineers, Messrs. Pollard & Tingle, 31, Old Queen-street, Westminster, and at the Council offices. Form of tenders obtained only from Clerk to Council upon deposit of 5*l.* Bills of quantities can only be obtained from the engineers upon production of the form of tender. Sealed tenders, addressed to the Chairman of Council, indorsed "Sewage Disposal," to be delivered at the Council's offices before four on May 14.

MAY 16.—SOUTH SHIELDS.—SEASIDE IMPROVEMENTS.—South Shields Corporation invite tenders for the laying-out, formation, and construction of new roads across Bents from Erskine-road continuation southwards towards borough boundary. Drawings may be seen, and a copy of the form of tender, obtained at the office of Mr. S. E. Burgess, M.I.C.E., Borough Engineer and Surveyor, Chapter-row. Tenders (to be fully priced out in the schedule and totalled) must be delivered to the Town Clerk, Court-buildings, South Shields, not later than 4 p.m. on May 16, endorsed "Tender for Bents Roads."

MAY 25.—LEVENSHULME.—STREET WORKS.—Levenshulme U.D.C. invite tenders for sewering, draining, paving, curbing, flagging, channelling, and completing the following streets and passages in the council's district:—Emley-street extension, Gordon-avenue, passages rear of Delamere-road South, passage rear of Delamere-road and Stanhope-street, passages rear of Derby-street, Emley-street, and Chipping-street, passage rear of 1 to 23 and 2 to 24, Harrison-avenue, and passage rear of Randolph-street. Specifications, etc., from the Council's Surveyor, Mr. James Jepson, Guardian-chambers, Tiviot Dale, Stockport, on payment of 2*l.* 2s. Tenders, endorsed "Tender for Private Street Works," to be sealed and endorsed and delivered to Mr. J. Ogden Hardicker, Clerk to the Council, Northern Assurance-buildings, Albert-square, Manchester, on or before May 25.

NO DATE.—PLYMPTON ST. MARY.—ROADWAY.—Making of a roadway, about 60 yds. in length, and 12 ft. wide, from George-lane to Lower Chaddlewood Farm, in the parish of Plympton St. Mary, for Mr. G. W. C. Soltau-Symons. Plans and specifications may be seen, and further particulars can be obtained, of Mr. G. W. Soltau, surveyor, 7, Courtenay-street, Plymouth.

STONE, MATERIALS, AND STORES.

APRIL 30.—GOVAN.—STORES.—Govan Town Council invite tenders for yearly supply of:—(1) Engine-room stores, oil, waste, etc.; (2) cables; (3) cable accessories; (4) bitumen; (5) meters; (6) house fuse boxes; (7) wrought-iron tubes and fittings; (8) cast-iron pipes; (9) bricks and cement; (10) ironmongery, brushes, etc.; (11) paints, soap, varnishes, etc.; (12) timber; (13) carbons for arc lamps; (14) coal; (15) joint boxes; (16) motors; (17) motor starters. Schedules and forms of tender can be obtained from Mr. T. C. Parsons, Burgh Electrical Engineer, Helen-street, Govan. Sealed offers, marked "Tender for——," to be sent to Mr. J. A. Houston, Town Clerk, Town Hall, Govan, on or before Monday, April 30.

APRIL 30.—LYDD.—STONE.—The supply and delivery either at (*a*) railway station, Lydd; or (*b*) at the roadside where required by the Surveyor (1) 750 tons 1½-in quartzite, or 750 tons 1½-in. basalt; (2) 100 tons 1½-in. basalt; (3) 150 yds. double-screened gravel; (4) 230 yds. Kent rag broken. Sealed tenders, endorsed "Tenders for Stone," must be sent to Mr. Thomas Kettle, Borough Surveyor, Lydd, on or before April 30.

MAY 1.—DOCKING.—MATERIALS, ETC.—R.D.C. of Docking invite tenders for the supply of materials and team labour for the parishes comprised in the above district for the year ending March 31, 1907. Forms, etc., from Mr. W. W. Hopking, Great Bircham; or Mr. E. B. Burdon, Burnham Overy. The tenders must be returned to Mr. J. A. Stoughton, Clerk to the said Council, Workhouse, Docking, King's Lynn, by post, and marked outside "Tender for Materials," or "Team Labour," as the case may be, addressed to the Workhouse, Docking, King's Lynn, not later than 10 o'clock a.m. on May 1.

MAY 1.—SOUTHERN MAHRATTA.—TOOLS, ETC.—Southern Mahratta Railway Company, Ltd., Directors invite tenders for miscellaneous tools and stores, as per specifications and drawings, which may be seen at the offices of the Company, 46, Queen Anne's-gate. The charge for the specification is 1*l.* 1s. each, which will not be returned. Tenders must be sent in, addressed to the Secretary, Mr. Edw. Z. Thornton, marked "Tender for Miscellaneous Tools and Stores," not later than 12 o'clock noon on May 1.

MAY 2.—GLASGOW.—STORES.—Glasgow Corporation invite offers for the supply of the undernoted, as may be ordered for one year from May 31 next:—(1) cartage; (2) coal and dross; (3) oils, paints, etc.; (4) glass; (5) mason work; (6) fireclay pipes; (7) field drain pipes; (8) smith work; (9) timber; (10) whin metal and causewaying. Forms may be obtained on application to Mr. James Whitton, Superintendent of Parks, City-chambers, 249, George-street, Glasgow, and sealed offers, marked "Parks, Tender for——," must be lodged with Mr. A. W. Myles, Town Clerk, not later than 10 a.m. on May 2.

MAY 3.—ASHBY-DE LA-ZOUCH.—GRANITE.—Tenders for the supply of Nos. 1, 2, and 3, or X., XX., and XXX. broken granite or limestone as may be required for the year ending March 31, 1907, either delivered at the under-mentioned railway stations or by carts from the works to the several parishes in the district as are hereunder mentioned:—Railway stations: Ashby-de-la-Zouch, Heather, Measham, Moira, Donisthorpe, Snarestone, Shackerton, Woodville, Worthington. Parishes: Packington, Coleorton, Thringstone, Swannington, Ravenstone with Snibstone, Worthington, Stanton, Osgathorpe. Tenders to be sent to Mr. George Farmer, Clerk to the Council, Ashby-de-la-Zouch, marked "Tender for Granite or Limestone," together with samples of stone, on or before May 3.

MAY 3.—INDIA.—STORES.—The Great Indian Peninsula Railway Company Directors invite tenders for the supply of the following stores, namely:—Miscellaneous articles and materials; fencing wire strand; Sheffield tools, etc.; fencing materials. Forms, etc., may be obtained at office of Mr. J. L.

Berry, Secretary, 48, Copthall-avenue, London, E.C., on payment of the fee for the specification, which payment will not be returned. Tenders must be delivered in sealed envelopes, addressed to Mr. Berry, marked "Tender for Miscellaneous Articles," or as the case may be, not later than 11 a.m. on May 3.

MAY 3.—PORTRUSH.—STORES.—The directors of the Portrush Gas Company, Ltd., invite tenders for the supply of stores for the year ending March, 1907, as follows:—Meters; galvanised tubes; steam tubes; compo. pipe; fittings, galvanised; fittings, steam; oils—machine, gas engine, exhauster; paint; red oxide. Further particulars can be obtained from the Manager, Mr W. C. Pinkney, Gasworks, Portrush. Tenders, endorsed "Stores," to be delivered on or before 12 noon on May 3, to Mr. Thos. Bamford, Secretary.

MAY 5.—LEXDEN.—MATERIALS.—Lexden and Winstree R.D.C. invite tenders for the supply of local materials and team labour, and also for steam road roller, in the several parishes of the district, as under:—(1) For the supply and delivery of picked stones in any parish of the district; (2) for the supply of good pit stones at the various quarries in the district; (3) for the carting of stones from the quarries to the various parishes; (4) for the supply and delivery of broken Kentish flints alongside the wharves at East Mersea, West Mersea Hard, the Strood, Salcot, East Donyland, Fingringhoe, and the Hythe, Colchester; (5) for the unloading and carting from the above wharves to the roads in the various parishes; (6) for the hire of one or two steam road rollers. Forms, etc., from Mr. John Ennals, Surveyor's Office, Copford, near Colchester. Tenders to be sent to Mr. Chas. H. Tompson, Clerk, Victoria-chambers, Colchester, not later than May 5, at 4 p.m.

MAY 7.—WARRINGTON.—CEMENT.—Warrington Paving and Sewerage Committee invite tenders for 50 tons of cement, manufactured by one of the following makers:—Earle & Co., Hull; Saxon Portland Cement Company; and Rugby Portland Cement Company. Specifications and any further information may be obtained at the office of the Borough Surveyor, Town Hall, at which place tenders must be delivered before 12 o'clock, on May 7.

MAY 7.—WEST ASHFORD.—GRANITE.—West Ashford R.D.C. invite tenders for the supply of about 1,750 tons of either of the following:—Best blue Guernsey, Clee Hill, Aberdeen, Penlee, Basalt, or Cherbourg quartzite, to be delivered at the railway stations at Charing, Northfield, Ashford, Pluckley, Headcorn, and Great Chart Siding, in such quantities as the Surveyor shall from time to time order, for the year ending March 31, 1907. Forms of tender can be obtained on application to Mr. Alfred Sims, Surveyor to the Council, Surveyor's Office, Charing. Sealed tenders, accompanied by samples of the material, endorsed "Tender for Granite," addressed to the Chairman of the R.D.C., are to be delivered at the Union House, Westwell, Ashford, Kent, not later than May 7.

MAY 9.—BRADFORD.—MATERIALS.—Bradford Corporation invite tenders for the supply and delivery of the following articles, namely:—Pitch and oil required for street paving purposes; cast-iron gullies, ventilators, and storm grates; glazed earthenware pipes, blocks, and junctions; timber for sewerage and other works. Forms, etc., may be obtained on application at the office of Mr. J. H. Cox, City Surveyor, at the Town Hall. Sealed tenders, endorsed "Tender for Materials—Street Works," to be sent to Mr. Frederick Stevens, Town Clerk, Town Hall, Bradford, on or before May 9.

MAY 10.—MELFORD.—ANNUAL CONTRACTS.—Melford R.D.C. invite tenders for the supply of the undermentioned materials, etc., as may be required during the year ending March 31, 1907:—Broken granite; glazed sanitary drain pipes, 4 in. to 42 in. diameter; blue Staffordshire bricks and kerbs; York stone kerb; Portland cement; granite concrete flags; flints; chalk; road grates and frames; team labour; tools; steam rolling. Forms from Mr. Wm. Carver, C.E., Surveyor, 3, Melford-road, Sudbury, Suffolk. Sealed tenders to be sent in not later than May 10, addressed to Mr. H. C. Canham, Clerk, 68, Friars-street, Sudbury, Suffolk.

MAY 24.—GLASGOW.—MATERIALS, ETC.—Glasgow Corporation invite offers for materials and jobbing work required in the various departments (hospitals excepted) as follows, viz.:—(1) Ashlar; (2) asphalte grouting; (3) asphalte paving; (4) bricks; (5) brickwork; (6) Caithness and Arbroath pavements; (7) cartage work; (8) causeway work; (9) joiner work; (10) lime and cement; (11) manholes and gratings; (12) painter work; (13) paving and drainage works; (14) pipes and sewer bottoms; (15) pitch and oil; (16) plaster work; (17) plumber and gasfitting work; (18) repairing barrows, etc.; (19) sand; (20) smith work; (21) slater work; (22) whin and granite metal and binding. Specifications and forms of offer may be obtained on application at the office of Public Works, City-chambers, 64, Cochrane-street. Sealed offers, marked outside "Offer for——, Statute Labour Department," must be lodged with Mr. A. W. Myles, Town Clerk, City-chambers, Glasgow, on or before May 4.

No DATE.—DENTON.—TAR.—Denton U.D.C. Gas Committee invite tenders for tar, the same to be sent in or before May 3. Particulars may be obtained from the Gas Engineer, Mr. J. Chadwick Smith, Gasworks, Denton, near Manchester.

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*BUILDING AND SANITARY INSPECTOR	Egham U.D.C.	135*l.* per annum	May 5
*CLERK OF WORKS	Derbyshire Education Com'tee	3*l.* per week	May 6

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*FREEHOLD PREMISES, ELMHURST WORKS, STOKE-RD., GOSPORT—On the Premises	Llewellyn Puttock & Co.	May 3-4
*BUILDING SITE, COPTHALL AVENUE, E.C.—At the Mart	Ellis & Son	May 4
*FREEHOLD BUILDING LAND, HERTFORD.—Hertford	Norris & Duvall	May 5
*SURPLUS PLANT AND STOCK, TOTTENHAM—At Works, Hampden-road, Tottenham	Fuller, Horsey, Sons, & Cassell	May 8
*FREEHOLD BUILDING, ETC., ESTATE, SOUTHAMPTON.—At the Mart	Edwin Fox & Bousfield	May 16
*FREEHOLD BUILDING ESTATE, STRATFORD—At the Mart	Fuller, Horsey, Sons, & Cassell	May 22
*FREEHOLD BUILDING EST., PARK ROYAL, WILLESDEN & TWYFORD.—At the Mart.	Debenham, Tewson, & Co.	do.
*FREEHOLD PROPERTY, HAMMERSMITH.—At the Mart.	Debenham, Tewson, & Co.	do.
*FREEHOLD BUILDING SITE, CRANE COURT, FLEET-STREET, E.C.—At the Mart	Debenham, Tewson, & Co.	do.
*CONTRACTORS' PLANT & MACHY., STHMPTON.—Contractors' Depot, Southampton Docks	Fuller, Horsey, Sons, & Cassell	May 23
*FREEHOLD BUILDING SITE, KING'S CROSS, W.C.—At the Mart	Edwin Fox & Bousfield	do.
*FREEHOLD BUILDING SITE, SHAFTESBURY-AVENUE, W.C.—At the Mart.	Edwin Fox & Bousfield	do.
*FREEHOLD CEMENT WORKS, DOVERCOURT, HARWICH.—At the Mart	Debenham, Tewson, & Co.	May 29
*FREEHOLD SITE, ETC., KENNINGTON PARK-ROAD—At the Mart	Farebrother, Ellis, Breech, Galsworthy, & Co.	May 31
*FREEHOLD BUILDING ESTATE, SEAFORD—At the Mart	Farebrother, Ellis, Breech, Galsworthy & Co.	do.
*BUILDING PROPERTY AND SITES, SEAFORD—At the Mart	Farebrother, Ellis, Breech, Galsworthy, & Co.	do.

PATENTS.—*Continued from page 473.*

a wedge-like locking action, and the invention consists of the arrangement that the racks are engaged by pinions on a shaft having loose rollers for guiding the chains or the like supporting a counter weight suspended from the window frame, so that the lowering and raising of the window take place independently of the racks, which serve only to produce the movement of the window against the packing.

12,254 of 1905.—E. H. BENTLEY: *A Dust and Draught Excluder for Doors.*

This relates to a dust and draught excluder and consists of two stretchers hinged together, and recessed to interlock and overlap, the stretcher attached to the door overlapping the bottom stretcher, and the latter being of such a section and hinged to the former in such a manner that when the door is open it oscillates upon its hinges and lifts the bottom edge clear of the door step or floor. A stud anti-friction bowl or the like mounted upon the door-jamb acts to return the hinged stretcher into position immediately the door is closed.

13,595 of 1905.—W. J. AKERS and L. A. ROCHAIX: *Devices for Preventing the Down Draught in Smoke and other Flues.*

This relates to an apparatus for use in flues or chimneys, and consists of a frame fitted across the flue, and a fan or rotating vanes driven by the updraught and mounted on a bearing carried by a slide withdrawable from the flue, and a brake operated from outside the chimneys retarding the rotation of the vanes.

13,843 of 1905.—W. BENTLEY and W. J. D. THOMPSON: *Sliding Windows and Window Frames.*

This relates to a sliding window-sash and window-frame, and is characterised by means whereby outside of the window-frame is fitted with one window-guide for each sash, and the window-sash or sashes are provided with guiding members, each having two contact points to engage the opposite sides of the window-guides and hold the window-sash relatively thereto.

24,526 of 1905.—E. COIGNET: *Reinforced Concrete Foundations.*

This relates to the establishment of foundations, comprising inverted vaults, or arches, or plane slabs, the chief of which, by the intermediary of piers constituted in the form of longitudinal girders receiving the heaviest concentrated loads, the other secondary assisting the former by causing the participation in the support of these loads of the greatest possible extent of ground and receiving a fraction of the loads by the intermediary of secondary piers which are likewise constituted as girders either cantilever fashion upon the principal pier, or resting at each extremity upon a principal pier.

26,685 of 1905.—A. E. WATSON: *Window Sash Fastener.*

This relates to a window sash fastener, wherein a pawl is furnished with a lever extending therefrom to facilitate its release from a serrated plate, a spring being also applied to said lever to press the pawl into the serrations of said plate.

26,757 of 1905.—E. EAST and J. MEAD: *Draught and Weather Excluder for Windows and the like.*

This relates to draught and weather exclusion apparatus for windows and the like. In carrying the invention into effect, a metallic movable flat bar is constructed, with two slots, and through these slots the movable bar is supported by means of half round-headed screws, screwed into the top bar of a glazed frame, and when the aforesaid glazed frame is being closed the movable bar in its action at one end slides or travels into its locking position by a quadrant plate, which is screwed into a recess cut in the window-frame, and the movable bar at the other end slides or travels up a sloping path formed at the base to an opening constructed in the metallic locking plate until it arrives on a ledge or shelf, when the glazed frame is closed. When the glazed frame is opened, the flat movable bar drops or falls on the screws by means of the slots described.

16,197 of 1905.—J. MOWAT and J. MACKINNON: *Lamps for Street Lighting.*

This relates to a lamp for street lighting, having its body of corner astragals made integral with the crinoline or batten frame by forming the latter with sockets to which the astragals are united by running with molten metal.

19,686 of 1905.—W. FREAKLEY and R. BILL: *Process and Apparatus for the Manufacture of Materials for the Construction of Dustless Roads and like Surfaces.*

This relates to the preparation of materials for the construction of dustless roads and like surfaces by the process of saturating crushed furnace slag with tar, creosote, or other suitable bituminous substance or solution in a heated state, by the application of heat and atmospheric pressure.

25,321 of 1905.—G. ATHERTON: *Heat Radiators.*

This relates to a heater comprising oppositely disposed heat boxes, a burner tube extending between the same, radiator tubes likewise extending between said heat boxes, the hot gases being conducted in the same direction through certain of said radiator tubes, and an exhaust chamber in one of said heat boxes in communication with one of said radiator tubes, the passage of the gases through said last-named tubes being in a direction opposite to said first-named direction, each of the heat boxes being provided between the rows of radiator tubes with air passages.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

April 9.—By WILKINSON, SON, & WELCH (at Brighton).

Brighton.—4, Clifton-ter., f., y.r. 61*l.*	£900
12, Clifton-ter., f., y.r. 73*l.*	1,050
17, Clifton-ter., f., y.r. 61*l.*	870
20, Clifton-ter., f., y.r. 61*l.*	850

April 10.—By SPELMANS' (at Yarmouth).

Yarmouth.—6 to 12, Ordnance-rd., u.t. 36½ yrs., g.r. 8*l.* 8s., y.r. 88*l.* 10s.	930
55 and 56, Admiralty-rd., u.t. 38½ yrs., g.r. 2*l.* 13s., y.r. 29*l.* 10s.	358

By G. B. HILLIARD & SON (at Southminster).

Southminster, Essex.—Cripplegate cottages (four), f., y.r. 20*l.*	205

April 11.—By MADDISON, MILES, & MADDISON (at Yarmouth).

Wickhampton, Norfolk.—Freehold grazing marshes, 36 a. 3 r. 36 p.	1,300
Toft Monks, Norfolk.—Freehold grazing marshes, 13 a. 1 r. 8 p.	200

April 19.—By J. A. & W. THARP.

Whitechapel.—123 and 125, Whitechapel-rd. (s.), area 2,250 ft., f., p.	2,060

By WORSFOLD & HAYWARD (at Dover).

Dover, Kent.—Beach-st., "The Terminus Hotel," f., y.r. 70*l.*	1,450
4, Maison Dieu-rd., f., p.	780
Dieu Stone-la., The Union Hall (factory) and Cottage adjoining, f., y.r. 120*l.*	1,550
Hougham, Kent.—"The Royal Oak Inn," f., y.r. 50*l.*	1,600
Capel-le-Ferne, Kent.—"Hurst Farm," 39 a. 1 r. 1 p., f., y.r. 60*l.*	1,000
St. Margaret's-at-Cliffe, Kent.—"Sunnyside," f. p.	235
Kingsdown-st., five freehold cottages	400

April 20.—By HARMAN BROS.

Whitechapel.—4 and 5, Little Alie-st. (s.), u.t. 83½ yrs., g.r. 26*l.*, w.r. 213*l.* 4s.	1,150

By H. TUFNELL.

Blackheath.—170, Humber-rd., u.t. 64 yrs., g.r. 5*l.* 5s., e.r. 30*l.*	225

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

TO CORRESPONDENTS.

J. and F. (amounts should have been stated).

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We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and consider articles offered for acceptance unless they are type-written.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

MEETINGS.

FRIDAY, APRIL 27.

Architectural Association.—Mr. Walter Cave on "Fenestration." 7.30 p.m.

Institution of Mechanical Engineers.—Mr. Louis Greaven on "Petroleum Fuel in Locomotives on the Tehuantepec National Railroad of Mexico." 8 p.m.

SATURDAY, APRIL 28.

Royal Institution.—Professor C. Waldstein, on "English Furniture in the XVIIIth century."—I. 3 p.m.

Junior Institution of Engineers.—Visit the works of the Croydon Gas Company, Waddon. 3 p.m.

Institute of Sanitary Engineers.—Visit to Fulham refuse destructors. 2.30 p.m.

MONDAY, APRIL 30.

Society of Arts (Cantor Lectures).—Mr. Alfred Maskell, F.S.A., on "Ivory."—II. 8 p.m.

TUESDAY, MAY 1.

Royal Institution.—Professor G. Baldwin Brown, M.A., on "Greek Classical Dress in Life and in Art."—II. 5 p.m.

Institute of Sanitary Engineers (Students' Lecture).—Dr. J. Priestley, B.A., on "Sanitary Law." 7 p.m.

WEDNESDAY, MAY 2.

Royal Archæological Institute.—(1) Notes on Fonts, by Mr. Alfred Fryer, F.S.A.; (2) "Excavations in Hayling Island," by Mr. Talfourd Ely, F.S.A. 4 p.m.

Institution of Civil Engineers.—Special meeting: The Fourteenth "James Forrest" Lecture, by Mr. R. A. Hadfield. Subject: "Unsolved Problems in Metallurgy." 8 p.m.

Institute of Sanitary Engineers.—Mr. G. W. Chilvers, on "Meteorology in Relation to Sanitary Work." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Society of Arts.—Mr. J. B. Millet, on "Submarine Signalling." 8 p.m.

THURSDAY, MAY 3.

Civil and Mechanical Engineers' Society.—Paper by Mr. W. O Travis, M.D., entitled "Some Observations on Bacterial Tank Operations." 8 p.m.

Carpenters' Hall, London Wall (Lectures on Carpentry and Joinery).—Mr. J. Bartlett on "Shoring, Timber Framing, and Floors." 7.30 p.m.

SATURDAY, MAY 5.

Royal Institution.—Professor C. Waldstein, on "English Furniture in the XVIIIth century."—II. 3 p.m.

Edinburgh Architectural Association.—Visit to Newbattle Abbey, Dalkeith, N.B.

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PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 8 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 5 0	" " "
Picked Stocks for Facings	2 15 0	" delivered.
Flettons	1 6 0	" at railway depôt.
Red Wire Cuts	1 12 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	3 15 0	" " "
Do. Bullnose	4 0 0	" " "
Best Stourbridge Fire Bricks	3 14 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	12 0 0	" " "
Headers	11 0 0	" " "
Quoins, Bullnose, and Flats	16 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamferred, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand	6 9	per yard, delivered.
Thames Ballast	5 3	" "
Best Portland Cement	25 0	per ton, "
Best Ground Blue Lias Lime	19 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	11s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks	27s. 0d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 2½	" "

	s. d.	
Ancaster in blocks	1 10	per ft. cube, deld. rly. depôt.
Beer "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 2	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "
YORK STONE—*Robin Hood Quality.*		
Scappled random blocks	2 10	" "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per ft. super., "
6 in. rubbed two sides ditto, ditto	2 6	" "

STONE (*continued*).

YORK STONE—*Robin Hood Quality (continued).*

	s. d.	
3 in. sawn two sides slabs (random sizes)	0 11½	per ft. spr. deld. rly. depôt.
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "
HARD YORK—		
Scappled random blocks	3 0	per ft. cube, "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 8	per ft. super., "
6 in. rubbed two sides ditto	3 0	" "
3 in. sawn two sides slabs (random sizes)	1 2	" "
in. self-faced random flags	0 5	" "

	s. d.	
Hopton Wood (Hard Bed) in blocks	2 0	per ft. cube, deld. rly. depôt.
" " " 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
" " " 3 in. sawn both sides random slabs	1 0	" "
" " " 2 in. do.	0 8½	" "

SLATES.

In. In.	£ s. d.	
20×10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20×12 " "	13 17 6	" "
20×10 first quality "	13 0 0	" "
20×12 " "	13 15 0	" "
16×8 " "	7 5 0	" "
20×10 best blue Portmadoc	12 12 6	" "
16×8 " "	6 12 6	" "
20×10 best Eureka unfading green	15 17 6	" "
20×12 " "	18 7 6	" "
18×10 " "	13 5 0	" "
16×8 " "	10 5 0	" "
20×10 permanent green	11 12 6	" "
18×10 " "	9 12 6	" "
16×8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz. "
Best Broseley tiles	50 0	per 1000 "
Do. Ornamental tiles	52 6	" "
Hip and Valley tiles	4 0	per doz. "
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000 "
Do. Ornamental do.	60 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 0	" "
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 "
Do. Ornamental do.	54 6	" "
Hip tiles	4 1	per doz. "
Valley tiles	3 8	" "
Best "Rosemary" brand plain tiles	48 0	per 1000 "
Best Ornamental tiles	50 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 8	" "
Best "Hartshill" brand plain tiles, sand-faced	50 0	per 1000 "
Do pressed	47 6	" "
Do. Ornamental do.	50 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 6	" "

WOOD.

BUILDING WOOD.	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	... 15 0 0
Deals: best 3 by 9	13 0 0	... 14 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 0 0	... 12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best.
Battens: seconds	0 10 0	" "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	... 10 0 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	... 9 10 0
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	"

	At per load of 50 ft.	
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	... 5 0 0
Seconds	4 0 0	... 4 10 0
Small timber (8 in. to 10 in.)	3 12 6	... 3 15 0
Small timber (6 in. to 8 in.)	3 0 0	... 3 10 0
Swedish balks	2 10 0	... 3 0 0
Pitch-pine timber (30 ft. average)	4 0 0	... 4 15 0

JOINERS' WOOD.	At per standard.	
White Sea: first yellow deals, 3 in. by 11 in.	24 0 0	... 25 0 0
3 in. by 9 in.	22 0 0	... 23 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	... 18 0 0
Second yellow deals, 3 in. by 1 in.	18 10 0	... 20 0 0
" " 3 in. by 9 in.	17 10 0	... 19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	... 14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	13 10 0	... 15 0 0
Battens, 2½ in. and 3 in. by 7 in.	11 0 0	... 12 0 0
Petersburg first yellow deals, 3 in. by 11 in.	21 0 0	... 22 10 0
Do. 3 in. by 9 in.	18 0 0	... 19 10 0
Battens	13 10 0	... 15 0 0
Second yellow deals, 3in. by 11in.	16 0 0	... 17 0 0
Do. 3 in. by 9 in.	14 10 0	... 16 0 0
Battens	11 0 0	... 12 10 0
Third yellow deals, 3 in. by 11 in.	13 0 0	... 14 0 0
Do. 3 in. by 9 in.	12 10 0	... 14 0 0
Battens	10 0 0	... 11 0 0

WOOD (*continued*).

JOINERS' WOOD (*continued*)—	At per standard. £ s. d.		£ s. d.
White Sea and Petersburg—			
First white deals, 3 in. by 11 in.	14 10 0	...	15 10 0
,, 3 in. by 9 in.	13 10 0	...	14 10 0
Battens	11 0 0	...	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	...	14 10 0
,, ,, 3 in. by 9 in.	12 10 0	...	13 10 0
,, ,, battens	10 0 0	...	11 0 0
Pitch-pine: deals	18 0 0	...	21 0 0
Under 2 in. thick extra	0 10 0	...	1 0 0
Yellow Pine—First, regular sizes	44 0 0	upwards.	
Oddments	32 0 0	,,	
Seconds, regular sizes	33 0 0	,,	
Yellow Pine oddments	28 0 0	,,	
Kauri Pine—Planks, per ft. cube	0 3 6	...	0 5 0
Danzig and Stettin Oak Logs—			
Large, per ft. cube	0 3 0	...	0 3 6
Small ,, ,,	0 2 6	...	0 2 9
Wainscot Oak Logs, per ft. cube	0 5 6	...	0 6 0
Dry Wainscot Oak, per ft. sup. as inch	0 0 8½	...	0 0 9½
¼ in. do. do	0 0 7	...	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	...	0 1 0
Selected, Figury, per ft. super. as inch	0 1 6	...	0 2 6
Dry Walnut, American, per ft. super. as inch	0 0 10	...	0 1 0
Teak, per load	17 0 0	...	22 0 0
American Whitewood Planks, per ft. cube	0 4 0	...	0 5 0
Prepared Flooring, etc.—	Per square.		
1 in. by 7 in. yellow, planed and shot	0 13 6	...	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	...	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	...	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	...	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	...	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	...	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	...	0 13 6
1 in. by 7 in. ,, ,,	0 14 0	...	0 18 0
¾ in. by 7 in. white ,, ,,	0 10 0	...	0 11 6
1 in. by 7 in. ,, ,, ,,	0 12 9	...	0 15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.		£ s. d.
Rolled Steel Joists, ordinary sections	7 0 0	...	7 10 0
Compound Girders, ordinary sections	9 0 0	...	10 0 0
Steel Compound Stanchions	12 0 0	...	13 0 0
Angles, Tees, and Channels, ordinary sections	9 0 0	...	10 0 0
Flitch Plates	9 0 0	...	10 0 0
Cast Iron Columns and Stanchions including ordinary patterns	7 10 0	...	8 10 0

METALS.

IRON—	Per ton, in London. £ s. d.		£ s. d.
Common Bars	8 0 0	...	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	...	9 0 0
Staffordshire "Marked Bars"	10 10 0	...	—
Mild Steel Bars	8 15 0	...	9 0 0
Hoop Iron, basis price	9 5 0	...	9 10 0
,, ,, Galvanised	17 0 0	...	—
(*And upwards, according to size and gauge.)			
Sheet Iron Black—			
Ordinary sizes to 20 g.	9 10 0	...	—
,, ,, 24 g.	10 10 0	...	—
,, ,, 26 g.	12 0 0	...	—
Sheet Iron, Galvanised, flat, ordinary quality—			
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	14 0 0	...	—
Ordinary sizes to 22 g. and 24 g.	14 10 0	...	—
,, ,, 26 g.	15 0 0	...	—
Sheet Iron, Galvanised, flat, best quality—			
Ordinary sizes to 20 g.	17 0 0	...	—
,, ,, 22 g. and 24 g.	17 10 0	...	—
,, ,, 26 g.	19 0 0	...	—
Galvanised Corrugated Sheets—			
Ordinary sizes 6 ft. to 8 ft. 20 g.	14 0 0	...	—
,, ,, 22 g. and 24 g.	14 10 0	...	—
,, ,, 26 g.	15 15 0	...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 10 0	...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 10 0	...	—
,, ,, 26 g.	14 15 0	...	—
Cut Nails, 3 in. to 6 in.	9 10 0	...	9 15 0
(Under 3 in., usual trade extras.)			

LEAD, &c.	Per ton, in London. £ s. d.		£ s. d.
LEAD—Sheet, English, 3lb. and up.	18 10 0	...	—
Pipe in coils	19 0 0	...	—
Soil pipe	21 10 0	...	—
Compo pipe	21 10 0	...	—
ZINC—Sheet—			
Vieille Montagne ton	32 0 0	...	—
Silesian	31 0 0	...	—
COPPER—			
Strong Sheet per lb.	0 1 0	...	—
Thin ,,	0 1 1	...	—
Copper nails ,,	0 0 11	...	—
BRASS—			
Strong Sheet ,,	0 0 11	...	—
Thin ,,	0 1 0	...	—
TIN—English Ingots ,,	0 1 9	...	—
SOLDER—Plumbers' ,,	0 0 8	...	—
Tinmen's ,,	0 0 10	...	—
Blowpipe ,,	0 0 11	...	—

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds	2¼d. per ft. delivered.
,, fourths	1¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths	2½d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, fourths	3¼d. ,, ,,
32 oz. thirds	5d. ,, ,,
,, fourths	4¼d. ,, ,,
Fluted Sheet, 15 oz.	3¾d. ,, ,,
,, 21 oz.	4¼d. ,, ,,

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

⅛ Hartley's	2d. per ft. delivered.
1/16 ,,	2½d. ,, ,,
¼ ,,	2½d. ,, ,,
Figured and Oxford Rolled	
"Oceanic" Glass, white	4d. ,, ,,
Do. ,, tinted	5½d. ,, ,,

OILS, &c.		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 2 0
,, ,, ,, in barrels	,,	0 2 1
,, ,, ,, in drums	,,	0 2 3
Boiled ,, ,, in pipes	,,	0 2 2
,, ,, ,, in barrels	,,	0 2 3
,, ,, ,, in drums	,,	0 2 5
Turpentine in barrels	,,	0 3 11
,, in drums	,,	0 4 1
Genuine Ground English White Lead	per ton	22 10 0
Red Lead, Dry	,,	21 10 0
Best Linseed Oil Putty	per cwt.	0 7 0
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

PUBLISHER'S NOTICES.

Nat. Tel., 6112, Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME LXXXIX. (July to December, 1905) was given as a supplement with the issue of January 13th.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (Cloth), with Strings, price 9d. each,

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. Stamps *must not* be sent, but all sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," Catherine Street, W.C.

Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Outside Wrapper should be in by TWELVE NOON on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, etc., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

ADVERTISERS in "THE BUILDER" may have *Replies addressed to the Office*, Catherine Street, Covent Garden, W.C., *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

N.B.—The Reply Boxes are not intended for trade lists, circulars, and the like; should these be received, they cannot (if noticed) be forwarded.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. By post (carefully packed) 1s.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ABERDEEN.—For laying granite causeway at Urquhart road, for the Town Council. Mr. W. Dyack, Burgh Surveyor, 41½, Union-street, Aberdeen:—

P. Tawse, School-road £1,498 11

ALLOA.—For street works, Queen-street, etc., for the Town Council Messrs. T. Frame & Sons, Surveyors, 43, Mill-street, Alloa:—

J. B. Shaw	£904 16 2	J. & J. Neilson	£782 6 6
W. Dobson	828 9 9	A. Robertson	741 13 3
Tothian Quarry Co.	817 19 10	Tawin & Co.	734 19 2½
J. Phillip	805 14 6	J. Martin	726 17 6
J. Walker	795 15 1	W. Wilson	721 12 5½
T. Christie	794 14 4	J. Thomson, Alloa*	705 8 1½

BEANWORTH.—For erecting school and house, for Southampton County Council. Mr. W. J. Taylor, County Surveyor, The Castle, Winchester:—

C. Wright	£2,021 15 1	Hale Bros.	£1,717 0 0
Parnell & Son	1,971 0 0	Grace & Sons	1,708 16 6
Crosby & Co.	1,969 0 0	Annett & Sons, Andover*	1,545 0 0
Jenkins & Sons	1,868 0 0		
Eddolls	1,823 1 6		

BECKENHAM.—For making-up Westfield, Studland, and Christ Church roads, for the Urban District Council. Mr. J. A. Angell, Surveyor, Beckenham:—

	Westfield-road. £	Studland-road. £	Christchurch-road. £	Total. £
E. Iles	684	223	118	1,025
Free & Son	686	214	114	1,014
W. Pearce	686	192	119	998
Woodhams & Son	684	200	115	991
Mowlem & Co., Westminster*	653	179	103	935

BILLERICAY (Essex).—For a small villa. Mr. R. Mawhood, architect:—

Avey	£155	Woodward, Stock*	£115
Baker & Son	430	F. Cracknell	410

BIRMINGHAM.—For additions to premises Caroline-street, for Messrs. Goodman, Ltd. Messrs. Ingall, Son & Mitton, architects and surveyors, 3, Temple-row West, Birmingham. Mr. J. Percival Bridgewater, quantity surveyor, Queen's-chambers, Colmore-row, Birmingham.

J. E. Harper	£3,365 15 10	J. Dallow & Sons	£3,184 0 0
T. Loud & Sons	3,297 0 0	W. J. Whittall & Son	3,119 0 0
T. Mills & Sons	3,270 0 0	W. Harvey Gibbs*	3,015 0 0
A. J. Teall	3,200 0 0		

CARDIFF.—For new warehouse premises, Tredegar-street, for Mr. Alfred Lewis, estate agent, Cardiff. Messrs. Habershon, Fawckner, & Co., architects:—

G. Hallet	£2,100 0 0	E. Turner & Sons	£1,929 0 0
D. Dancs & Sons	2,072 0 0	F. C. Williams	1,923 0 0
J. Allan & Sons	2,020 0 0	Tucker Bros.	1,903 13 10
C. Shopland	1,999 0 0	G. Beams	1,898 10 0
W. Will	1,999 0 0	E. T. Bevan	1,858 0 0
W. Symonds & Co.	1,990 0 0	W. T. Morgan	1,840 0 0
Knox & Wells	1,939 0 0	E. R. Evans & Bros., Cardiff*	1,825 0 0

CHELTENHAM.—For the execution of street improvement works in Hayward's-road, for the Corporation. Surveyors: The Borough Surveyor, Cheltenham, and Surveyor to Charlton Kings Urban District Council (jointly):—

M. Williams & Co., Cheltenham* £215 17 6

COSBY.—For repairs, new vestry, etc., to Cosby church, seven miles from Leicester. Mr. H. Cayley, architect, Bank-chambers, Rothwell, Kettering. Quantities by the architect:—

W. J. Bloxham	£1,599 0 0	W. Moss & Sons	£1,090 10 0
R. Cosford	1,580 0 0	T. Herbert (late Cockran)	1,076 9 6
H. Smith	1,297 0 0	E. J. Bradford	1,073 4 0
S. F. Halliday	1,248 15 0	J. R. Cooke, Broughton Astley, Scurr, Jowitt, & Co.	1,059 7 0
W. Lord	1,215 10 0		
G. Henson & Sons	1,177 0 0		
T. E. Banbury	1,115 17 0		
Bowman & Sons	1,100 0 0	Rugby*	1,035 10 0
Houghton & Co.	1,093 15 0	J. & A. Agar	1,016 0 0

ENFIELD.—For making up private streets, for the Urban District Council. Mr. R. Collins, Surveyor, Public Offices, Enfield.—

—	Morley-hill. £ s. d.	Birkbeck-road. £ s. d.	Seaford-road. £ s. d.
Fry Bros.	1,271 10 1	1,262 13 11	921 8 8
T. Adams	1,269 0 0	1,249 0 0	982 0 0
E. J. Betts, Enfield Highway*	1,155 0 0	1,135 0 0	915 0 0

ENNISKILLEN.—For erecting buildings for stores at Springfield Creamery, for Springfield Agricultural Society. Mr. W. Scott, architect, Victoria-terrace, Enniskillen:—

J. Hynes & Sons	£225 0	J. Flanagan, Monea*	£179 10
J. Donnelly	206 0		
N. Nixon	201 4		

GREAT BADDON (Essex).—For pair of villas. Mr. R. Mawhood, architect, Chelmsford:—

J. Gowers	£946 0	F. Cracknell, Great Baddon*	£826 0
W. Fincham	945 0	F. Weight	810 0
Choat & Son	920 0	Baker & Sons	798 10
Rayner	855 0		
Samms	840 0		

HASTINGS.—For erecting four cottages in the parish of Brede, for the Corporation. Mr. P. H. Palmer, Borough Engineer, Town Hall, Hastings:—

W. H. Thorpe, Albany-house, St. Helens, Hastings*. £760

LONDON.—For alterations and extension to premises, No. 45, High-street, Lewisham, for Messrs. Cheeseman Bros.:—

Kennard Bros.* £838 10

LONDON.—For Spanish mahogany work in forming new offices for Messrs. Knight & Co., Tooley-street, S.E., from drawings prepared by Messrs. A. Thwaites & Co.:—

C. A. King, late D. King & Son..... £793

LOUGHBOROUGH.—For Shepshed water supply works, for the Water Committee of the Corporation. Mr. A. H. Walker, Waterworks Engineer, Town Hall, Loughborough:—

H. E. Buckley	£2,957 13 6	J. & J. Warner	£3,057 0 0
Johnson & Langley ..	2,900 0 0	Clay Cross Co.	2,330 18 0
F. G. Collingwood & Co.	2,892 0 0	J. J. Macdonald	2,320 0 0
Mitchell & Sons.....	2,888 0 0	T. Egan & Sons.....	2,288 7 6
J. Moffatt ..	2,857 18 3	W. Moss & Sons, Ltd..	2,276 0 0
Hardy & Atkinson ..	2,735 15 10	J. Hawley ..	3,265 2 10
J. Lincoln & Sons	2,512 0 0	Jenkins & Sons.....	2,248 0 0
E. Tabor....	2,439 19 5	Jowett Bros..	2,190 9 6
H. Shardlow	2,401 17 11	J. W. Dean, Ltd.	2,114 14 1
C. E. Cox & Co.	2,370 18 0	H. Siddons..	2,077 10 11
J. T. Ball ..	2,360 0 0	H. Ashley, Mansfield‡.	2,041 0 0

‡ Recommended for acceptance.

LYNN.—For rebuilding, etc., of the Flower Pot public-house, Norfolk-street, for Messrs. W. & T. Bagge, Lynn. Mr. H. T. Tilson, architect, Railway-road, King's Lynn:—

J. Medwell ..	£1,662 0 0	Read & Wildbur.....	£1,540 0 0
Dye & Allen..	1,614 0 0	W. F. Smith..	1,519 0 0
Spaulding & Hampton ..	1,550 15 0	F. Anderson..	1,512 8 6
Tash & Langley....	1,549 16 9	J. J. Rone ..	1,464 0 0
		W. White* ..	1,250 0 0

[All of King's Lynn. The tenders are exclusive of a portion of mason's bill.]

MIDSOMER NORTON (Somerset).—For erecting an open-air swimming bath, for the Urban District Council. Mr. W. Bevan, Surveyor, Town Hall, Midsomer Norton:—

W. A. Catley	£264 10	J. Bird, Radstock*.	£245 0
T. Foster	285 0		

[Surveyor's estimate, £243 10s. 9d.]

MONMOUTH.—For the erection of a pair of houses in Redbrook-road, Monmouth, for Mr. H. F. Perkins. Mr. E. G. Davies, architect, Hereford and Monmouth:—

G. R. Edwards.	£796 3 8	W. J. Morgan ..	£630 0 0
J. J. Walby....	720 0 0	J. Hall	625 0 0
T. & C. Panter..	698 10 6	O. Parry	619 19 9
G. Jones	690 0 0	J. Edwards & Son	549 0 0
R. L. Friend ..	680 0 0	S. Shaw, Usk, Monmouth*..	510 0 0
W. C. Bolt	635 0 0		
T. Pembridge ..	634 0 0		

MONMOUTH.—For the drainage, with necessary manholes, etc., at the Union for the Board of Guardians. Mr. E. G. Davies, architect, Hereford and Monmouth:—

O. Parry	£277 17 0	R. L. Friend ..	£175 0 0
Walters & Son..	250 0 0	T. Ballinger, Dingestow, Monmouth*..	170 0 0
Phillips	198 19 2		
G. Jones	184 0 0		

MONMOUTH.—For alterations and additions to Pen-y-walk, Tregare, for the Rev. Wm. Evans, vicar. Mr. E. G. Davies, architect, Hereford and Monmouth:—

G. Coombes	£357 19	W. Morgan	£190 0
R. L. Friend	300 0	S. Shaw	180 0
T. H. Jones.....	273 0	T. Ballinger, Dingestow*	180 0
Wood & Mackie ..	195 0		

ROXWELL (Essex).—For rebuilding house at Boggiss Farm. Mr. R. Mawhood, architect:—

Baker & Sons	£400	Allen & Gowers, Chelmsford*	£375

[Amended tenders.]

SHOEBURYNESS.—For erecting five cottages, Friars-street. Mr. F. J. Winter, architect, 9, Norfolk-avenue, Southend-on-Sea:—

J. & W. Ventris	£1,125 0 0	Cater & Co. ..	£944 1 8
E. Wingrave	1,095 15 0	H. R. Wilkinson	924 10 0
G. S. Saunders	1,065 10 0	H. W. Grainger, Southchurch*	900 0 0
A. J. Harris ..	970 0 0		

SKIPTON.—For paving, kerbing, and channelling of Rostle Top-street, Earby, for the Rural District Council. Mr. A. Rodwell, Surveyor, Skipton:—

J. W. Hopkins, Earby..... £413 19 6

TAMWORTH.—For new buildings and alterations to premises in Orchard-street, the Leys, for the Industrial Co-operative Society, Ltd. Mr. Francis B. Andrews, architect, 95, Colmore-row, Birmingham:—

W. Bishop	£5,185 0	T. Elvins	£4,895 0
E. Williams	5,113 0	Watton & Sons .	4,889 0
J. Smith & Sons.	5,078 0	W. Robinson ..	4,766 0
C. E. Shuttleworth.....	5,022 10	C. Clarson & Sons, Tamworth* ..	4,718 0
J. Barnsley & Sons	5,002 0	B. Musson	4,677 0
H. Smith	4,936 0	Kettering Co-op. Builders	4,271 0

TREORCHY.—For the extension of Horeb English Baptist Chapel, for the church trustees. Mr. W. D. Morgan, architect, Victoria-chambers, Pentre:—

J. Evans £1,401
G. Edwards, 1, Station-road, Treorchy*.. 1,300

WALTON-ON-THAMES.—For constructing 270 yds. of 8-in. cast-iron pipe sewer, Russell-road, for the Urban District Council. Mr. R. Wilds, Engineer and Surveyor, Council Offices, Walton-on-Thames. Quantities by Engineer:—

S. Lane	£1,161 17 9	G. Bell & Sons, Ltd.	£667 0 0
J. Shelbourne & Co.	865 14 8	S. Atkins....	658 8 11
G. Chesswat	843 6 0	E. Potterton & Co.	602 1 8
W. H. Gaze & Sons	695 9 9	J. Jackson, Plaistow*	596 7 7

WIMBLEDON.—For the extension of the Slipper baths, Latimer-road, for the Corporation. Mr. C. H. Cooper, Engineer and Surveyor, Town Hall, Wimbledon:—

Parsons & Townsend	£2,007	W. S. Shepherd & Co.	£1,754
J. Barrett	1,913	Martin, Wells, & Co.	1,750
G. Bellom	1,888	B. E. Nightingale..	1,733
H. E. H. Buckingham	1,844	R. Dean & Co.	1,705
J. Burges & Sons ..	1,800	W. H. Hyde	1,685
E. P. Bulled & Co..	1,773	F. G. Lawrence, Kingston*	1,540
F. & G. Foster	1,769		
J. Garrett & Sons..	1,767		

WORKINGTON.—For altering and extending the Central Hotel, for Workington Brewery Co., Ltd. Messrs. Oliver & Dodgshun, architects, Carlisle:—

T. Mackenzie	£3,757 14 4	J. Shackley ..	£2,808 17 0
H. Killip	3,179 9 0	B. Hyde, Workington*	2,707 18 3
T. Johnston ..	2,924 18 6		

Refreshment Shelter, Boscombe.—In our last issue, page 451, we stated that Messrs. Jenkins & Sons, Ltd., of Bournemouth, had secured the contract at 75*l.* for a refreshment shelter on the shore at Boscombe. This should have been 756*l.*

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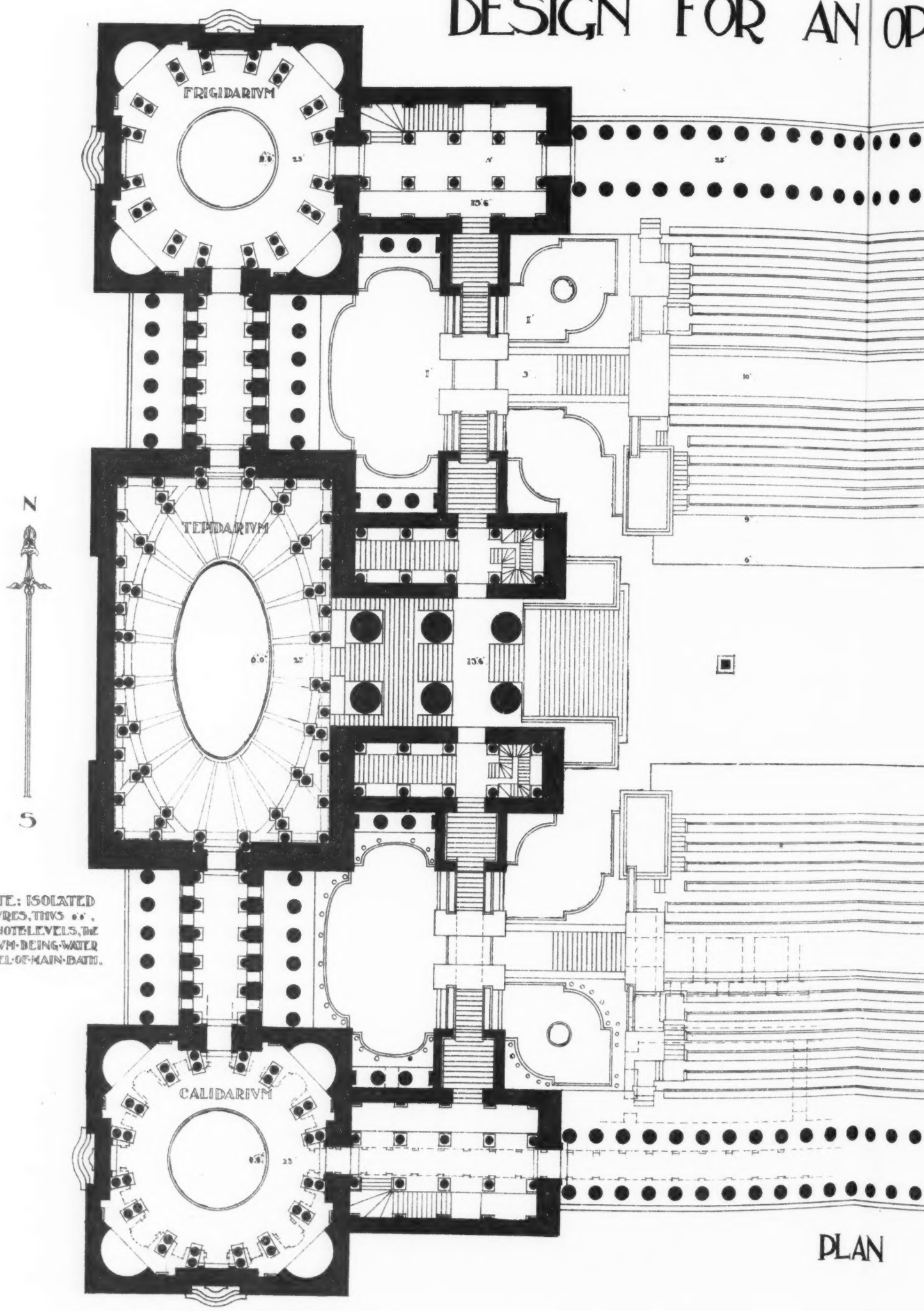

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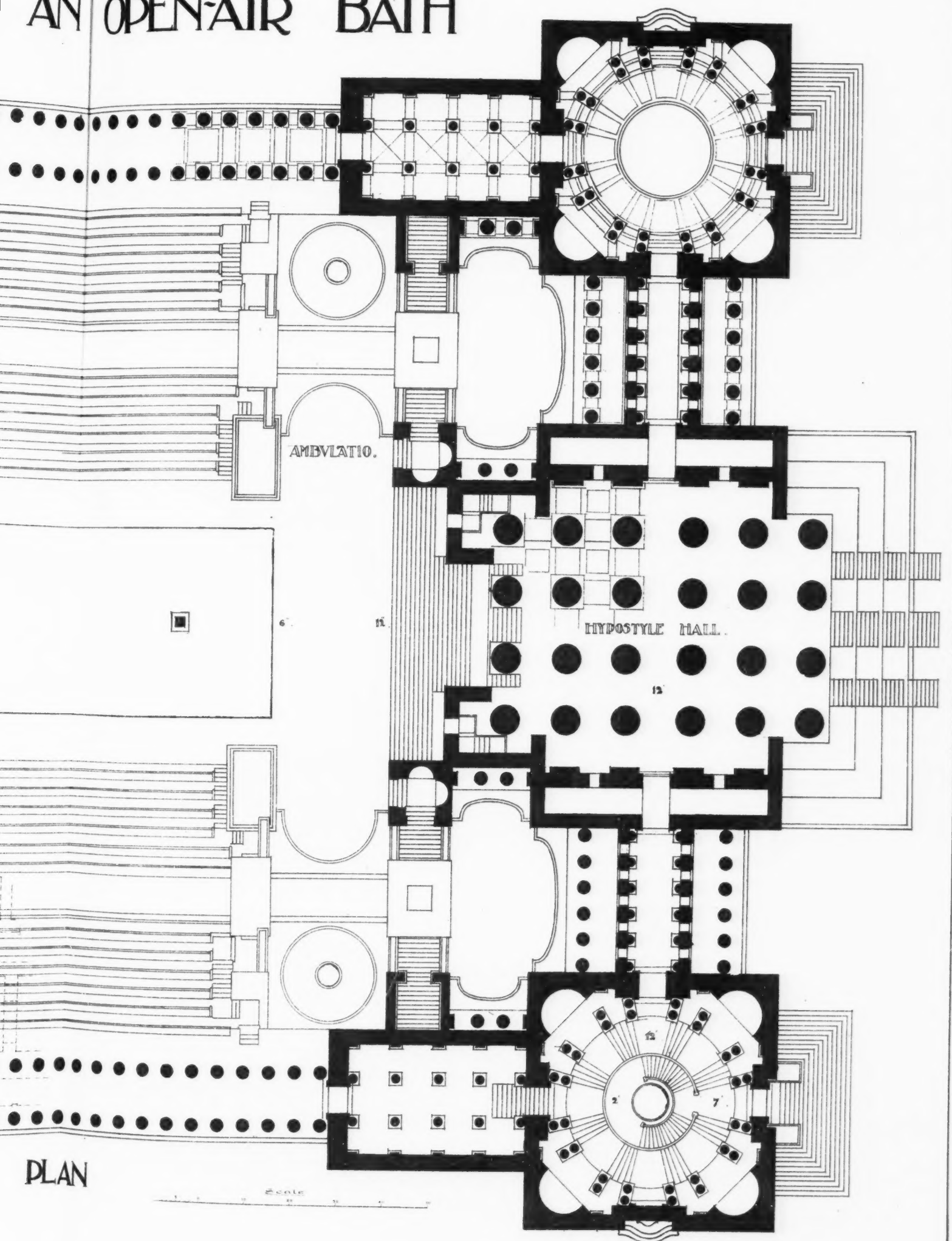
Submitted in Competition for the Tite Prize

AN OPEN-AIR BATH



PLAN

Scale

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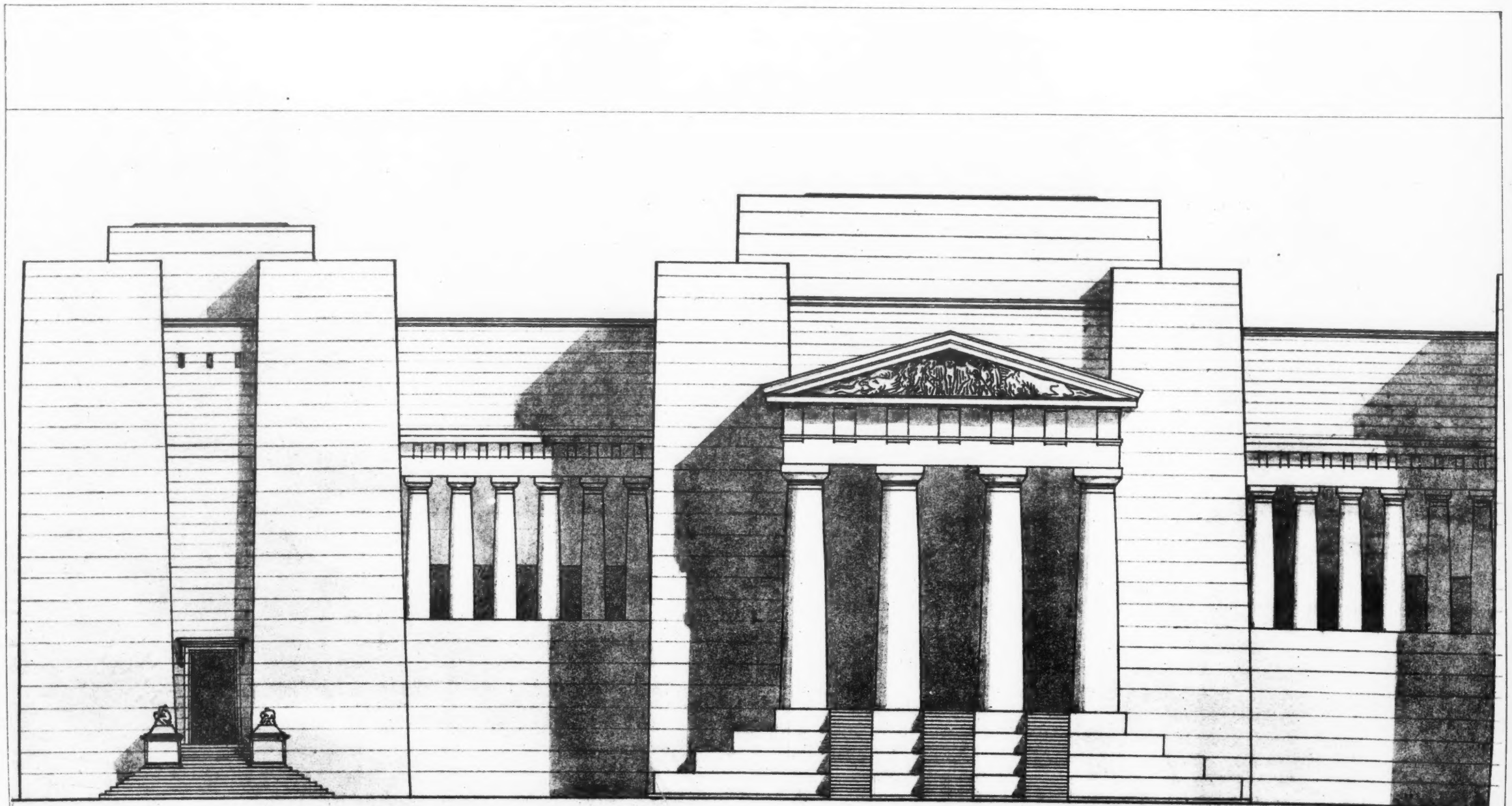

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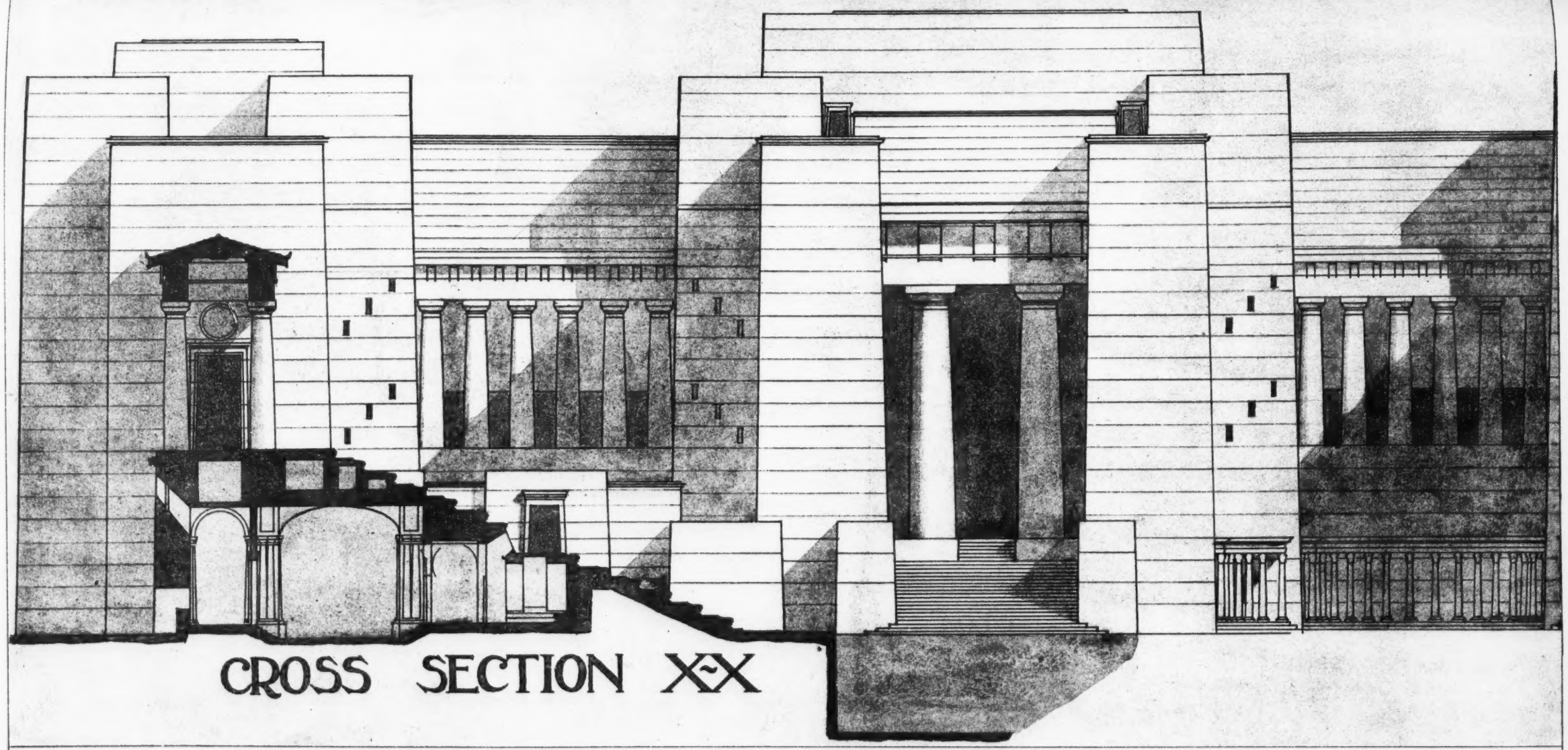

CROSS SECTION X-X

DESIGN FOR AN OPEN-AIR SWIMMING BATH: SUBMITTED IN COMPETITION FOR THE TITE PRIZE

By Mr. J. Arthur Berrington, A.R.I.B.A.

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